ORDER NO. CPD9806032C0
G22

Service Manual

Notebook Computer

CF-45

This is the Service Manual for the following areas.

- [M] ... for U.S.A. and Canada
- [E] ... for U.K.
- [G] ... for Germany
- [F] ... for France
- [S] ... for Sweden
- [T] ... for Italy

Model Number Reference

The models in the CF-45 series are numbered in accordance with the types of the CPU, LCD and HDD etc. featured by the product.

Model No.CF-45 [ ][ ][ ][ ] A or J A [ ]

CPU type
- M: for Pentium® Processor with MMX™ technology 200MHz
- N: for Pentium® Processor with MMX™ technology 233MHz

LCD type
- J: for 12.1" TFT Color

HDD type
- F: for 2GB
- 4: for 4GB

RAM size
- 8: 32MB

Area
- M: for U.S.A. and Canada
- E: for U.K.
- G: for Germany
- F: for France
- S: for Sweden
- T: for Italy

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic®

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For U.K.

WARNINGS

- Disconnect the mains plug from the supply socket when not in use.
- This equipment is not designed for connection to an IT power system.
- Care must be taken to ensure that the integrity of the PELV (Protective Extra Low Voltage) system is maintained when interface to other parts of equipment takes place.

This apparatus must be earthed for your safety.

To ensure safe operation three pin-plug (not for U.K.) must be inserted only into a standard tree-pin power point which is effectively earthed through the normal household wiring.
Ensure the main outlet socket is easily accessible to enable the user to isolate the apparatus from the main supply by withdrawing the main plug.
Extension cords used with the equipment must be three core and be correctly wired to provide connection to earth. Wrongly wired extension cords are major cause of fatalities.
The fact that the equipment operates satisfactorily does not imply that the power point is earthed and that the installation is completely safe.
For your safety, if any doubt about the effective earthing of the power point, consult a qualified electrician.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

Green-and-Yellow: Earth
Blue: Neutral
Brown: Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured marking identifying the terminals in your plug, produced as follows: The wire which is coloured GREEN-and-YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol or coloured GREEN of GREEN-and-YELLOW.
The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.
The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

LITHIUM BATTERY ⚠

- **CAUTION**

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the equipment manufacture.
Discard used batteries according to the manufacturer's instructions.

LITHIUMBATTERIE ⚠

Vorsicht!
Explosionsgefahr bei unsachgemäßem Austausch der Batterie. Ersatz nur durch denselben order einen vom Hersteller empfohlenen ähnlichen Typ. Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

PILE AU LITHIUM ⚠

ATTENTION: IL Y A DANGER D'EXPLOSION S' IL Y A REMPLACEMENT INCORRECT DE LA PILE. REMPLACER UNIQUEMENT AVEC UNE PILE DU MÊME TYPE OU D'UN TYPE RECOMMANDÉ PAR LE CONSTRUCTEUR. METTRE AU RÉBUT LES PILES USAGÉES CONFORMÉMENT AUX INSTRUCTIONS DU FABRICANT.

LASER SAFETY INFORMATION

For U.S.A.

Class 1 LASER Product

This product is certified to comply with DHHS Rules 21 CFR Subchapter J.
This product complies with European Standard EN60825 (or IEC Publication 825)

For all areas

This equipment is classified as a class 1 level LASER product and there is no hazardous LASER radiation.

Caution:

(1) Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
(2) The drive is designed to be incorporated into a computer-based system or unit which has an enclosing cover. It should never be used as a stand alone drive.

Danger:

The serviceman should not remove the cover of drive unit and should not service because the drive unit is a non-serviceable part.

- Unplug the AC power cord to the equipment before opening the top cover of the drive.
- When the power switch it on, do not place your eyes close to the front panel door to look into the interior of the unit.

LASER Specification

Class 1 level LASER Product
Wave Length: 775 - 815 nm

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1. Specification

1. SYSTEM BOARD

Items	Description
1.1 Micro Processor Type	Intel Pentium® Processor with MMX™ Technology 200MHz Pentium® Processor with MMX™ Technology 233MHz
1.2 Co-Processor	Build in the Micro Processor
1.3 Core Logic	Intel FW82439TX(MTXC): 430TX PCIset System Controller Host bridge, Memory I/F FW82371EB(PIIX4E): PCI to ISA / IDE Xelerator PCI to ISA bridge, IDE I/F, DMA, Timer, PIC, USB I/F, Real Time clock, Power management
1.4 VGA Controller	Neo Magic MN2160B: Flat Panel Video Accelerator 2 MB memory, RAMDAC, Graphic Acceleration, Video Acceleration PCI Bus I/F
1.5 PCMCIA Controller	Texas Instruments PCI1250A: (PCI-Card Bus Bridge) PCMCIA2.1/JEIDA4.2 Bridge, CardBus Bridge PCI Bus I/F
1.7 Internal Cache	32 Kbytes
1.8 External Cashe	256Kbytes PB Cashe
1.9 Standard RAM configuration	32Mbytes EDO DRAM (4Mbits x 16)x 4 pieces 640 Kbytes conventional memory, 128 Kbytes BIOS shadow memory, 64 Kbytes System Management memory, and Extended memory
1.10 RAM Expantion	On-board RAM: 32Mbytes ExtRAM card: 16Mbytes / 32Mbytes / 64Mbytes Total Memory: 48Mbytes / 64Mbytes / 96Mbytes
1.11 Super I/O	National Semiconductor PC97338: Plug and Play Compatible Super I/O with Floppy Disk Controller, Dual UARTs, Infrared port, And IEEE1284 Parallel Port FDC(PC8477), UART I/F(PC16550s), Infrared I/F(IrDA), IEEE1284(ECP) ISA Bus I/F
1.12 BIOS ROM	256 Kbytes (256K x 8 bits Flash EPROM) System BIOS, VGA BIOS BIOS update can be done by BIOS update utility.
1.13 SOUND Controller	YAMAHA YMF715E: OPL3 single-chip Audio System 3 FM-synthesizer, WSS, PnP ISA 1.0a, ZV port support, Sound Blaster Pro compatible ISA Bus I/F

Items	Description	
1.14 External connector	Parallel(IEEE1284)	25 pin Dsub female
	Serial(RS232C)	9 pin Dsub male (up to 115kbps)
	CRT	15 pin Dsub female 640 x 480: 60/75/85Hz (max. 16,777,216 colors) 800 x 600: 60/75/85Hz (max. 16,777,216 colors) 1024 x 768: 60/75/85Hz (max. 65536 colors) 1280 x1024: 60/75Hz (max. 256 colors)
	Keyboard/PS2 mouse	6 pin mini-DIN (auto detection)
	Infrared Port	(IrDA, 4Mbps)
	USB	4pin male
	Microphone (in)	Stereo Jack (mono)
	Headphone (out)	Stereo Jack (stereo)
	Port Replicator	Dedicated 100 pin female
	AC IN	DC 15.6V3.85A
1.15 PC Card SLOT	PC Card type I or II x 2 slots or type III x 1 slot Max. Output current +5V 400mA, +12V 120mA, +3.3V 400mA (68 pins) Both of slotssupport Zoomed Video	

2. Floppy Disk Drive

Items	Description
2.1 Floppy Disk Drive	Double sided, High density, Double tracked with shutter Model No. D353G MITSUMI ELECTRIC Co., Ltd.
2.2 Recording Capacity	Per disk(formatted) 1.44Mbytes/720Kbytes* Per disk(unformatted) 2Mbytes/1Mbytes* Per track(unformatted) 12.5Kbytes/6.25Kbytes*
2.3 Transfer Rate	500 / 250* Kbits/sec Media type(2HD/2DD) is detected automatically at formatting.
2.4 Access Time	Track to track seek time 3 msec max. Seek settling time 15 msec max. Media rotating time 300 rpm +-2.0% Start time 600 msec max. Typical access time 94 msec
2.5 Recording Density	Max. 17434/8717* BPI
2.6 Number of Track	Max. 160 tracks
2.7 Data Encode Method	MFM
2.8 Recording Media	Micro floppy disk 3-1/2"(2HD/2DD*)
2.9 LED Color	Green
2.10 Mean Time Between Failure	30,000 Power-on hours(5% Duty)
2.11 Mean Time To Repair	30 minutes
2.12 Component Life	5 years
2.13 Error Rate	Soft read error 10^{-9} bit Hard read error 10^{-12} bit Seek error 10^{-6} bit
2.14 Preventive Maintenance	Only head cleaning if it is dusty.
2.15 Size	101.6(W) x 101.6(D) x 12.7(H) mm
2.16 Weight	150 g(max)

*: 720 Mbytes (formatted) mode only

3.CD-ROM Drive

Items	Description
3.1 CD-ROM Drive	5.25" CD-ROM Unit Model No. CD-220EA TEAC Co.,Ltd.
3.2 Data Capacity	540 Mbytes
3.3 Data Transfer Rate (from media)	Normal velocity mode 150 Kbytes/sec Typical velocity 1290~3000 Kbytes/sec (CAV)
3.4 Access Time	Typical 130 msec (Random)
3.5 Host Interface	ATAPI (SFF8020I Rev. 2.6)
3.6 Buffer Size	128 Kbytes
3.7 ECC Type	Embedded CD-ROM XA
3.8 Mean Time Between Failure	60000 Power-on hours (Duty 10% Motor On)
3.9 Error Rate	10^{-9} bits (MODE 1,MODE 2 Form 1) 10^{-12} bits (MODE 2 Form 2 , CD-DA)
3.10 Size	128.0(W) x 126.1(D) x 12.7(H) mm (Excludeing final bezel)
3.11 Weight	280g (typ)

4. DISPLAY UNIT

Items	Description
4.1 LCD Type	12.1" TFT Color Active Matrix LCD FL Backlight (White) MODEL No. FLC31SVCS-10 Fujitsu Co.,Ltd.
4.2 Dot Pixels	800 (x RGB) x 600
4.3 Dot Size	0.3075(0.1025 x RGB) x 0.3075
4.4 Dot Pitch	0.3075(0.1025 x RGB) x 0.3075 mm
4.5 Character Box	8 dots(W) x 16/19 dots(H) as standard
4.6 Display Area	246 x 184.6 mm
4.7 Aspect Ratio	1:1
4.8 Contrast Ratio	Typ. 100
4.9 Response Time	Typ. 100 ms Max. 150 ms (rising) Typ. 50 ms Max. 150 ms (falling)
4.10 Surface Process	Non-glare surface without protection panel
4.11 Display Mode	SVGA mode
4.12 Size	275.5(W) x 199(H) x 6.5 (D) mm
4.13 Weight	Max. 500 g

5. SOFTWARE

Items	Description
5.1 System BIOS	IBM BIOS with ACPI V1.0, APM rev.1.2, PCI 1.0a, PnP 1.0a, SM(DMI)2.0 and Setup
5.2 VGA BIOS	VGA BIOS with VESA Extension VBE2.0, VBE/DDC 1.0, VBE/PM 1.0
5.3 Security Features	User Password Protection, Supervisor password, Coffee break password.
5.4 Operation System	Windows 95 is pre-installed into Hard Disk.
5.5 Diagnostics Program	Diagnostics Program is supplied.

6. POWER MANAGEMENT

Items	Description
6.1 CPU Power Saving	(1)with APM APM switches CPU to Stop Grant / Stop clock mode Automatically depending on system condition. (2)without APM CPU power management circuit switches CPU to Stop grant automatically depending on system condition (keyboard/mouse(internal pointing device, external mouse), interrupt, HDD/FDD/CD-ROM/Serial port /Parallel port access) to have less power consumption with reasonable performance during both AC and battery operation. CPU power saving can be disabled by SETUP program. (3)with ACPI The ACPI aware OS such as Windows98 will automatically controll all devices which have a power save mode,depending on the system condition.

Items	Description
6.2 Device Stand-by	Some device sub-systems have own power management capability which is controlled by device time-out value as follows during AC and/or battery operation. In order to conserve battery power each device has a time-out value which is specified by SETUP program. When the timer has expired the device goes into power down mode. In stand-by mode all available devices go to power down mode to minimize the power consumption. -Hard disk drive : 1 min, off -CD-ROM drive : 1 min, off -Auto stand-by : 1 min, 2 min, off -Auto Hibernation/Suspend : 4 min, 16 min, off Each timer is reset by following conditions. -Hard disk drive :hard disk access -CD-ROM drive :CD-ROM access -Auto stand-by :keyboard, mouse, serial, Ir, parallel or FDD/HDD access, LCD open/close -Auto Hibernation/Suspend :keyboard, mouse, serial, Ir, parallel or FDD/HDD access, LCD open/close Each device goes into normal mode by the following conditions. -Hard disk drive :hard disk access -CD-ROM drive :CD-ROM access -Auto stand-by :keyboard, mouse, serial, Ir, parallel or FDD/HDD access, LCD open/close, AC in, power switch -Auto Hibernation/Suspend :power button
6.3 Low Voltage Warning	BATT LED is turned red, when the remaining battery capacity is approx. 9% or less. Beeping starts at last approx. 4% or less. The system will try to save all necessary information (resuming function). It is possible to resume the last operation by pressing the power button again after changing the battery or connecting the AC adapter.
6.4 Advanced Power Management	APM Rev.1.2 is supported by BIOS. APM software interface is used by Windows 95.
6.5 Battery Capacity Indicator	pop up on display, When pushing Fn-key & F9-key
6.6 ACPI support	ACPI V1.0 is supported by BIOS.

7. HARD DISK DRIVE

(2GB:Fujitsu Co.,LTD)

Items	Description
7.1.1 TYPE	TYPE # AUTO MODEL No. MHD2021AT Fujitsu Co.,LTD
7.1.2 CAPACITY formatted, logical	Per Drive Max. 2.160 Gbytes
7.1.3 DEFECT	Free
7.1.4 TRANSFER RATE (to/from media)	71.4 Mbits/sec max
7.1.5 TRANSFER RATE (to/from buffer)	16.6Mbytes/sec max(PIO MODE4)
7.1.6 SEEK TIME (Includes settling time)	Track to track 2.5 msec Average 13 msec Maximum 23 msec
7.1.7 AVERAGE LATENCY	7.5 msec
7.1.8 START UP TIME (up to READY)	Typ. 5 sec
7.1.9 READ / WRITE HEADS	Physical 4 Heads , Logical 16 Heads
7.1.10 DISKS	2
7.1.11 CYLINDERS	Logical 4200
7.1.12 SECTORS PER TRACK	Logical 63
7.1.13 BYTES PER SECTOR	512
7.1.14 ROTATION SPEED	4000 +-0.1 % rpm
7.1.15 RECORDING	157 KBPI
7.1.16 TRACK DENSITY	10.5 KTPI
7.1.17 DATA ENCODE METHOD	PRML (8/9)
7.1.18 REDUCED WRITE CURRENT	Automatic
7.1.19 SHIPPING ZONE CYLINDER NUMBER	Automatic
7.1.20 HOST INTERFACE	IDE (ATA-2/3)
7.1.21 BUFFER SIZE	128 Kbytes
7.1.22 INTERLEAVE FACTOR	1
7.1.23 POWER SAVING	During DC operation, in 1 minute after access to HDD,HDD stops automatically as standard.
7.1.24 MEAN TIME BETWEEN FAILURE	300,000 Power-on hours
7.1.25 ERROR RATE	Hard read error 10^{-13} bits
7.1.26 Size	70.0(W) x 100.0(D) x 9.5(H)mm
7.1.27 Weight	140g

(4GB:Toshiba Co.,LTD)

Items	Description
7.2.1 TYPE	TYPE # AUTO MODEL No. MK4006MAV Toshiba Co.,LTD
7.2.2 CAPACITY formatted, logical	Per Drive Max. 4.09 Gbytes
7.2.3 DEFECT	Free
7.2.4 TRANSFER RATE (to/from media)	91.9Mbits/sec max
7.2.5 TRANSFER RATE (to/from buffer)	16.6Mbytes/sec max(PIO MODE4)
7.2.6 SEEK TIME (Includes settling time)	Track to track 3 msec Average 13 msec Maximum 25 msec
7.2.7 AVERAGE LATENCY	7.14 msec
7.2.8 START UP TIME (up to READY)	Typ. 5 sec
7.2.9 READ / WRITE HEADS	Physical 6 Heads , Logical 16 Heads
7.2.10 DISKS	3
7.2.11 CYLINDERS	Logical 6600
7.2.12 SECTORS PER TRACK	Logical 63
7.2.13 BYTES PER SECTOR	512
7.2.14 ROTATION SPEED	4200 +-0.1 % rpm
7.2.15 RECORDING	157 KBPI
7.2.16 TRACK DENSITY	8,39 KTPI
7.2.17 DATA ENCODE METHOD	16/17EPR
7.2.18 REDUCED WRITE CURRENT	Automatic
7.2.19 SHIPPING ZONE CYLINDER NUMBER	Automatic
7.2.20 HOST INTERFACE	IDE (ATA-2/3/4)
7.2.21 BUFFER SIZE	512Kbytes
7.2.22 INTERLEAVE FACTOR	1
7.2.23 POWER SAVING	During DC operation, in 1 minute after access to HDD,HDD stops automatically as standard.
7.2.24 MEAN TIME BETWEEN FAILURE	300,000 Power-on hours
7.2.25 ERROR RATE	Hard read error 10^{-15} bits
7.2.26 Size	70.0(W) x 100.0(D) x 12.5(H)mm
7.2.27 Weight	150g

8. KEYBOARD UNIT

Items	Description
8.1 Keyboard Type	Membrane contact (U.S.A and Canada) MODEL No. NK15003-US Hon-Hai Co.,Ltd. (England) MODEL No. NK15003-UK Hon-Hai Co.,Ltd. (Germany) MOEDL No.NK15003-GER Hon-Hai Co.,Ltd. Membrane contact (Italy) MODEL No.NK15003-IT Hon-Hai Co.,Ltd. (France) MODEL No.NK15003-FR Hon-Hai Co.,Ltd. (Sweden) MOEDL No.NK15003-SD Hon-Hai Co.,Ltd.
8.2 Key Stroke	3.0 mm for all keys except small keys at top line 2.5 mm for Small keys at top line and 'Enter' and right 'Ctrl' keys
8.3 Key Roll-over	2 key roll-over
8.4 Number of Keys	87 Keys for US market 88 keys for European market including F11,F12,Fn and Keypad key
8.5 Software Compatibility	US and EUROPE :MS Natural Keyboard
8.6 Special Key Combinations	The following combinations are supported by BIOS and/or PMC. Fn + F1 : Fn + F2 : Brightness Fn + F3 : Display change Fn + F4 : Speaker Off/On Fn + F5 : Speaker Volume down Fn + F6 : Speaker Volume up Fn + F7 : Suspend (Store to RAM) [1] Fn + F8 : Power management off[1] Fn + F9 : Battery Gage Fn + F10 : Turn system standby mode[1] Fn + ten KeyPad : ten KeyPad Fn + KeyPad : Lock ten KeyPad (U.S.A,Canada,England ,German Italy ,France and Sweden) Alt+Ctl+F9 : Coffee Break Password Alt+Ctl+F10 : Alt+Ctl+F11 : Alt+Ctl+F12 :
8.7 Number of Colors	2 molding colors and 2 printing colors
8.8 Operating Life	5 Million cycles

[1] With ACPI OS, these key conbinations have no function.

9. POINTING DEVICE

Items	Description
9.1 Pointing Device Type	Track Ball type
9.2 Ball Size	φ 19 mm
9.3 Software Compatibility	PS/2 type
9.4 Number of Button	2 buttons
9.5 Power consumption	8mA (Max.) ,3mA (Typ.)

10. AC ADAPTER

Items	Description
10.1 AC Adapter Type	Wide voltage range AC adapter MODEL No. CF-AA1639 MITSUMI ELECTRIC Co., Ltd
10.2 Primary Voltage	100 Volts to 240 Volts AC±10%
10.3 Primary Frequency	50/60 Hz
10.4 Primary Load Current	100V-240V AC ,1.5A-0.7A
10.5 Secondary Voltage	DC 15.6 V
10.6 Secondary Current Capacity	Max. 3.85 A
10.7 Operating Temperature	0 to 40 deg C
10.8 Size	63 x 110 x 31.5 mm (without cable and plug)
10.9 Weight	360g±60g

11. BATTERY

(Lithium Ion Type)

Items	Description
11.1 Battery Pack	Lithium Ion rechargeable battery pack MODEL No.CGR-B/607B
11.2 Nominal Voltage	10.8 Volts
11.3 Nominal Capacity	2300mAh
11..4 Operating Time	Approx.1.0～2.5 hours Varies depending on the usage conditions.
11.5 Charging Time[1]	Approx. 2.0 h(Power Off),3.5 h(Power On)
11.6 Weight	280 g

[1] Power consuming condition Charging is done within approx.
the range 5 to 40 deg C,
Out side of this range, no charging is done against to protecting battery damage.

12. RTC BATTERY

Items	Description
12.1 Battery Type	Lithium battery MODEL No. CR2032 x 1 pc. Matsushita Battery Co., Ltd.
12.2 Nominal Voltage	3.0 Volts
12.3 Nominal Capacity	220 mAH
12.4 Operating Time	This battery is used for RTC backup. When the main battery pack is discharged and disconnected without the AC adapter, this battery supplies the power for RTC backup. RTC backup time is typ. 7 years.
12.5 Size	20(D) x 3.2(L) mm
12.7 Weight	2.5 g

13. OPERATION SWITCHES

Items	Description
13.1 Power Switch	Slide Type [POWER] (Toggle, it is pressed for more than 0.4 second.)
13.2 Reset Switch	Push button Type [RESET]

14. LED INDICATORS

Items	Description		
	ON		OFF
14.1 Power	Green Green (blinking every 1 second) Green (blinking every 3 seconds)	Power on Standby Suspend	Power off
14.2 Battery	Orange Green Red Orange flashing(5times)Red blinking	Charging Full charge Low battery Wait for start chargingSome trouble with charging controller or battery	No battery or stop charging
14.3 FDD	Green	FDD access	
14.4 HDD	Green	HDD access	
14.5 CD-ROM	Green	CD-ROM access	
14.6 Caps Lock	Green	Caps on	
14.7 Scroll Lock	Green	Scroll lock on	
14.8 Num Lock	Green	Numeric keys on	
14.9 Keypad Lock	Green	Keypad enable	

15. PHYSICAL SPECIFICATION

Items		Description
15.1 Dimension [1]	Width	11.7" (297 mm)
	Depth	9.1" (230 mm)
	Height	1.9" (50.7 mm)
15.2 Weight	With Battery	Approx. 2.9 Kg(6.4 lbs)with CD-ROM DRIVE
15.3 Temperature	Operating	5 to 35 deg C (41 to 95 deg F)
	Non Operating	-20 to 60 deg C (4 to 140 deg F) unpacked [2]
	Gradient	Max. 15 deg C/hour
15.4 Humidity	Operating	30 to 80 %
	Non Operating	30 to 90 %
15.5 Vibration	Non Operating	5 to 55 Hz Vertical (Z axis) 1.0G Horizontal (X axis) 0.5G Horizontal (Y axis) 0.5G * When packed for shipment
15.6 Drop Shock	Non Operating	50G * Dropped from 65 cm height * When packed for shipment

[1] Each value has +-0.4 mm deviation.
[2] Due to vendor's temperature specification limitation,
following part shall be viewed separately.

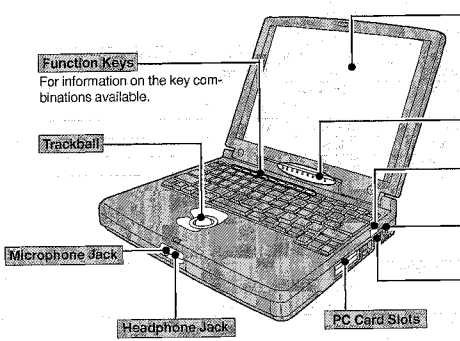
16. REGULATION APPROVALS

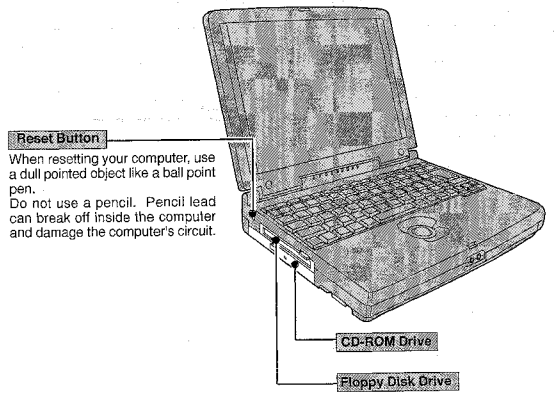
Items	Description
16.1 Safety Approval	UL(UL 1950)/TUV(EN60950) for Main Unit UL(UL 1950)/CSA(C22.2,No.234 Level 3 output, Class 2 output)/TUV(EN60950)/DENTORI for AC Adapter
16.2 EMC Approval	FCC class B CE(EN55022,EN50082-1)

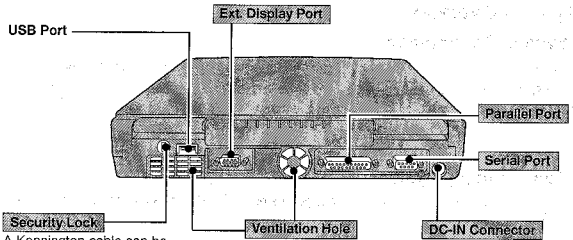
17. OPTIONS

Items	Description
17.1 Battery Pack	Same as Main Battery Pack
17.2 RAM Card	144pin SO-DIMM

2. Names and Functions of Parts

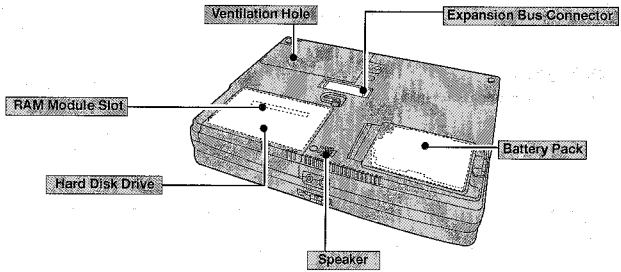

LCD
Function Keys
For information on the key combinations available.
LED Indicators
Trackball
Infrared Communication Port
Ext. Keyboard/Mouse Port
Microphone Jack
Power Switch
Before using the computer for the first time, carefully read the [Limited Use License Agreement]. If you agree to the conditions, remove the seal.
Headphone Jack
PC Card Slots
Use this connector to connect headphones or amplifier-equipped speakers. Audio output from the internal speaker is disabled when headphones or outside speakers are connected.


Reset Button
When resetting your computer, use a dull pointed object like a ball point pen.
Do not use a pencil. Pencil lead can break off inside the computer and damage the computer's circuit.
CD-ROM Drive
Floppy Disk Drive



A Kensington cable can be connected to prevent theft of your computer. For more information, please read the manual that comes with the cable.

These holes allow heat to exit.



- To adjust the volume*, select the on the task bar, then [Volume Control].
  * You may also use the function keys to perform this operation (Fn + F5 or F6).
- **Speaker on/off : Fn + F4**

3.Technical Information

3.1 System Overview

3.1.1 System Configuration

The main system is made up of a Main board, a Battery connector board, a LCD connector board, a CD-ROM connector board and a LED board.
The CPU operates at 2.8 V; the main memory at 3.3 V; the core logic at 3.3 or 5 V; and the other main chips at 3.3 V.

3.1.2 Power Supply System

The power supply used by the Main board is generated on the Main board based on the voltage from the AC adapter.

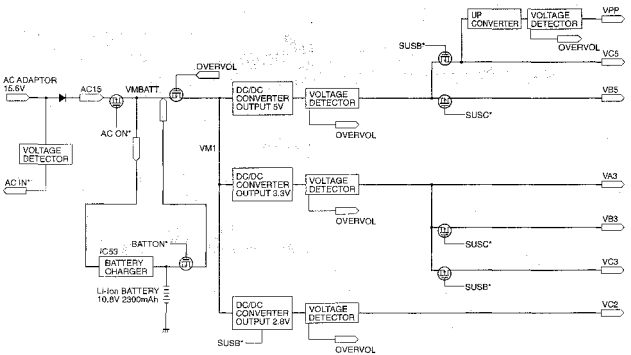
Power Supply System	Description	On mode	Suspend mode	Off/Hibernation mode
VC system (VC5, VC3, VC2)	CPU and logic power supply	ON	OFF	OFF
VB system (VB5, VB3)	Logic power supply	ON	ON	OFF
VA system (VA3)	PMC power supply	ON	ON	ON
VPP system (VPP)	12 V power supply, for the card slot	ON	OFF	OFF

Table 1: Description of Power Supply Systems

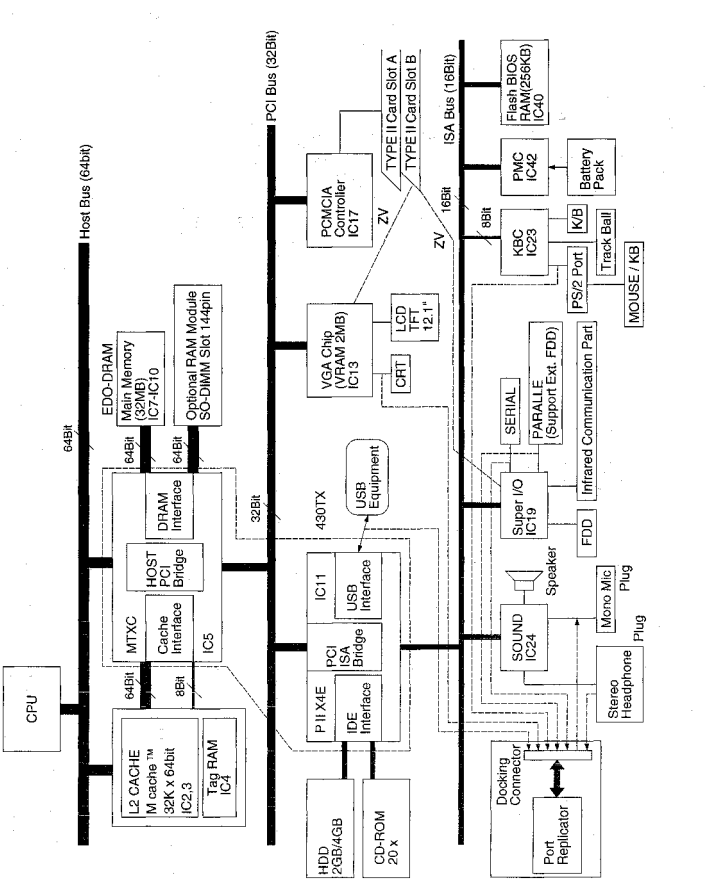
Power is supplied to the AC adapter and battery pack in that order when the RTC power is off or is in suspend mode. When neither power supply can be accessed, power is supplied from the clock battery (a coin battery).

Block Diagrams

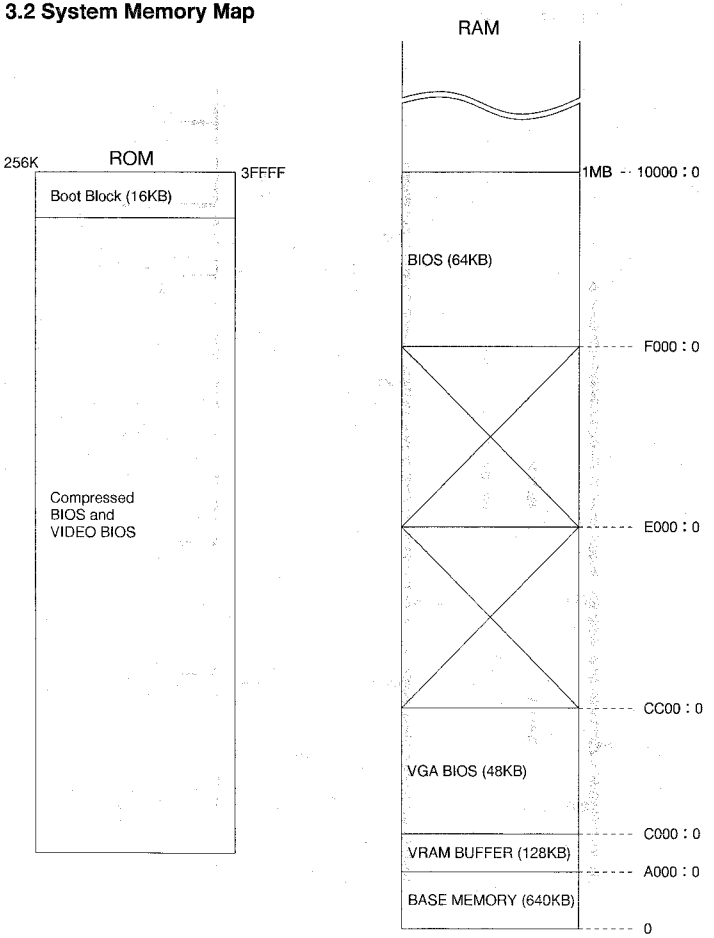
Power Supply Configuration Diagram



System Configuration Diagram



3.2 System Memory Map



3.3 I/O Address Map

1)System

Address	Function	IC No,
00H-1FH	DMA Controller	IC11
20H,21H	PIC	IC11
24H-3FH	Motherboard Resource	IC11
40H-43H	System Timer	IC11
50H-53H	Motherboard Resource	IC11
60H	Keyboard Controller	IC23
61H	System Speaker	IC11
62H	Motherboard Resource	IC11
64H	Keyboard Controller	IC23
66H	Motherboard Resource	IC11
70H,71H	RTC	IC11
72H-77H	Motherboard Resource	IC11
80H	PnP	IC11
81H-8FH	DMA Controller	IC11
90H-9FH	Motherboard Resource	IC11
A0H,A1H	PIC	IC11
A4H-BFH	Motherboard Resource	IC11
C0H-DFH	DMA Controller	IC11
F0H-FFH	Numeric Data Processor	CN18

2)Peripherals

Address	Function	IC No,
170H-177H	PCI IDE Controller(CDROM)	IC11
1F0H-1F7H	PCI IDE Controller(HDD)	IC11
203H	Motherboard Resource	IC11
220H-233H	Sound Chip	IC24
278H-27AH	LPT3	IC19
2A0H-2AFH	Motherboard Resource	IC11
2F8H-2FFH	IrDA	IC19
300H,301H	Sound Chip	IC24
370H,371H	Sound Chip	IC24
376H	PCI IDE Controller(CDROM)	IC11
378H-37AH	LPT1	IC19
388H-38BH	Sound Chip	IC24
398H,399H	Motherboard Resource	IC19
3B0H-3BBH	Video Controller	IC13
3C0H-3DFH	Video Controller	IC13
3F0H-3F5H	Floppy Disk Controller	IC19
3F6H	PCI IDE Controller(HDD)	IC11
3F7H	Floppy Disk Controller	IC19
3F8H-3FFH	COM1	IC19
4D0H,4D1H	PIC	IC11
530H-537H	Sound Chip	IC24
CF8H-CFFH	PCI Bus	IC11
1000H-101FH	USB	IC11
4000H-403FH	Motherboard Resource	IC11
FFA0H-FFA7H	PCI IDE Controller(HDD)	IC11
FFA8H-FFAFH	PCI IDE Controller(CDROM)	IC11

3.4 BIOS - CMOS Map

Name	Adr	Factory default	Setup default (PnP)	Description
RTC	00h	Time	Time	Time seconds in BCD
RTC	01h	99h	Not Touch	Alarm seconds in BCD
RTC	02h	Time	Time	Time minutes in BCD
RTC	03h	99h	Not Touch	Alarm minutes in BCD
RTC	04h	Time	Time	Time hours in BCD
RTC	05h	99h	Not Touch	Alarm hours in BCD
RTC	06h	Date	Date	Day of week (Sunday=1) in BCD
RTC	07h	Date	Date	Day of month in BCD
RTC	08h	Date	Date	Month in BCD
RTC	09h	Date	Date	Year (Two digits) in BCD
RTC status register A	0Ah	Auto	Auto	Bit7: Update in progress Bit4-6: 22-Stage Divider Bit0-3: Rate selection bits
RTC status register B (Alarm)	0Bh	Auto	Auto	Bit7: Set Bit6: Periodic interrupt enable Bit5: Alarm interrupt enable Bit4: Update-ended interrupt enable Bit3: Square wave enabled Bit2: Date mode Bit1: 24-hour mode Bit0: Daylight-saving time enabled
RTC status register C (Flags)	0Ch	Auto	Auto	Bit7: Interrupt request flag Bit6: Periodic interrupt flag Bit5: Alarm interrupt flag Bit4: Update-ended interrupt flag Bit0-3: (Reserved)
RTC status register D (Battery)	0Dh	Auto	Auto	Bit7: Valid RAM Bit0-6: (Reserved)
Post status	0Eh	00h	00h	Bit7=1: Boot fail Bit6=1: Checksum error Bit5=1: Configuration error Bit4=1: Memory size error Bit3=1: HD fail Bit2=1: Bad time Bit1=1: Adapter configuration Bit0=1: Adapter busy
Shutdown status	0Fh	00h	00h	BIOS Reserved
Diskette status	10h	40h	40h	Bit7-4: Diskette drive A =0000b: Drive not present =0001b: 360KB 5.25-inch drive, 40 tracks =0010b: 1.2MB 5.25-inch drive, 80 tracks =0011b: 720KB 3.5-inch drive, 80 tracks =0100b: 1.44MB 3.5-inch drive, 80 tracks =0101b: Reserved =0110b: 2.88MB 3.5-inch drive, 80 tracks =0111b-1111b: Reserved for future use Bit0-3: Diskette drive B
Cache Video Rom Cache Option Roms	11h	00h	00h	Bit7-2: Reserved Bit1: Cache option ROM enable (Reserved) Bit0: Cache Video ROM enable (Reserved)
Hard Disk 0 Type	12h	0F0h	0F0h	Drive type of drive 0 *Note: If this value is FFh, it means extended drive type see address 19h.*

Name	Adr	Factory default	Setup default (PnP)	Description
Hard Disk 1 Type	13h	00h	00h	Drive type of drive 1 *Note: If this value is FFh, it means extended drive type see address 1Ah.*
Equipment	14h	03h	02h	Bit6-7: Number of diskette drive installed. Other than physical drive 0 (values are binary). These 2 bits do not indicate locations of installed drives. =00: No other drives =01: 1 additional drives =10: 2 additional drives =11: 3 additional drives Bit4-5: Primary display video mode type, values are binary. =00: Other (for example, EGA or VGA) =01: 40×25 color CGA =10: 80×25 color CGA =11: 80×25 monochrome Bit2-3: (Reserved) Bit1=1: Coprocessor present Bit0=1: Diskette drive 0 is present
Base RAM size, Low	15h	80h	80h	Base memory size, low byte, in 1KB units
Base RAM size, High	16h	02h	02h	Base memory size, high byte, in 1KB units
Ext. RAM size, Low	17h	Auto	Auto	Ext. configured memory size, low byte, in 1KB units. *Note: If this value is FFFFh, it means memory size is over 64MB. See address E4h, E5h.*
Ext. RAM size, High	18h	Auto	Auto	Ext. configured memory size, high byte, in 1KB units. *Note: If this value is FFFFh, it means memory size is over 64MB. See address E4h, E5h.*
Hard disk 0 type	19h	7Fh	2ch	Extended drive type of drive 0 7Fh: Auto ID drive Automatic configuration value: If BIOS can detect HDD then auto-config value is 46h or can not detect HDD then auto-config value is 00h.
Hard disk 1 type	1Ah	00h	00h	Extended drive type of drive 0 (Reserved) See address 19h
Hard disk 2 type	1Bh	00h	7Eh	Extended drive type of drive 0 (Reserved) See address 19h
Hard disk 3 type	1Ch	00h	00h	Extended drive type of drive 0 (Reserved) See address 19h
ROM Shadow	1Dh	14h	14h	Bit7-4: ROM Shadow Bit7=1: ROM D8000h-DFFFFh shadow enable Bit6=1: ROM D0000h-D7FFFh shadow enable Bit5=1: ROM C8000h-CFFFFh shadow enable Bit4=1: ROM C0000h-C7FFFh shadow enable Bit3-2: CMOS_MemorySpeed (Reserved) Bit1-0: CMOS_MemErrorDetection (Reserved)
CMOS_Disk0_Parms	1Eh	Auto	Auto	Custom drive 0 parameters - Cylinder low Type 46 *Note: Automatic Configuration value POST should set here when type 46 HDD is exist.*
CMOS_Disk0_Parms	1Fh	Auto	Auto	Custom drive 0 parameters - Cylinder high Type 46 *Note: Automatic Configuration value POST should set here when type 46 HDD is exist.*
CMOS_Disk0_Parms	20h	Auto	Auto	Custom drive 0 parameters - Heads Type 46 *Note: Automatic Configuration value POST should set here when type 46 HDD is exist.*
CMOS_Disk0_Parms	21h	Auto	Auto	Custom drive 0 parameters - Precomp cyl Type 46 *Note: Automatic Configuration value POST should set here when type 46 HDD is exist.*
CMOS_Disk0_Parms	22h	Auto	Auto	Custom drive 0 parameters - Precomp cyl Type 46 *Note: Automatic Configuration value POST should set here when type 46 HDD is exist.*

Name	Adr	Factory default	Setup default (PnP)	Description
CMOS_Disk0_Parms	23h	Auto	Auto	Custom drive 0 parameters - Lz low Type 46 *Note: Automatic Configuration value POST should set here when type 46 HDD is exist.*
CMOS_Disk0_Parms	24h	Auto	Auto	Custom drive 0 parameters - Lz high Type 46 *Note: Automatic Configuration value POST should set here when type 46 HDD is exist.*
CMOS_Disk0_Parms	25h	Auto	Auto	Custom drive 0 parameters - Sectors/track Type 46 *Note: Automatic Configuration value POST should set here when type 46 HDD is exist.*
CMOS_Disk1_Parms	26h	Auto	Auto	Custom drive 1 parameters - Cylinder low Type 47 *Note: Automatic Configuration value POST should set here when type 47 HDD is exist.*
CMOS_Disk1_Parms	27h	Auto	Auto	Custom drive 1 parameters - Cylinder high Type 47 *Note: Automatic Configuration value POST should set here when type 47 HDD is exist.*
CMOS_Disk1_Parms	28h	Auto	Auto	Custom drive 1 parameters - Heads Type 47 *Note: Automatic Configuration value POST should set here when type 47 HDD is exist.*
CMOS_Disk1_Parms	29h	Auto	Auto	Custom drive 1 parameters - Precomp cyl Type 47 *Note: Automatic Configuration value POST should set here when type 47 HDD is exist.*
CMOS_Disk1_Parms	2Ah	Auto	Auto	Custom drive 1 parameters - Precomp cyl Type 47 *Note: Automatic Configuration value POST should set here when type 47 HDD is exist.*
CMOS_Disk1_Parms	2Bh	Auto	Auto	Custom drive 1 parameters - Lz low Type 47 *Note: Automatic Configuration value POST should set here when type 47 HDD is exist.*
CMOS_Disk1_Parms	2Ch	Auto	Auto	Custom drive 1 parameters - Lz high Type 47 *Note: Automatic Configuration value POST should set here when type 47 HDD is exist.*
CMOS_Disk1_Parms	2Dh	Auto	Auto	Custom drive 1 parameters - Sectors/track Type 47 *Note: Automatic Configuration value POST should set here when type 47 HDD is exist.*
Checksum1 High	2Eh	Auto	Auto	High byte CMOS checksum of 10h - 2Dh.
Checksum1 Low	2Fh	Auto	Auto	Low byte CMOS checksum of 10h - 2Dh.
Ext. RAM size, Low	30h	Auto	Auto	Ext. configured memory size, low byte, in 1KB units. *Note: Same as address 17h.*
Ext. RAM size, High	31h	Auto	Auto	Ext. configured memory size, high byte, in 1KB units. *Note: Same as address 18h.*
Date Century	32h	19h or 20h	19h or 20h	Date century byte, in BCD format
ACPI S3 Wakeup Running Hib Running Hib SPP Valid DRAM PARITY BootFail Count	33h	00h	04h	Bit7-4: Boot Fail Count Bit3: DRAM Parity error (Reserved) Bit2: Hibernation Special Partiton is valid Bit1: Hibernation Resume is Required Bit0: ACPI S3 Wakeup Running
SR ASMI Return	34h	Auto	Auto	ASMI function return code.
SR ASMI Error	35h	Auto	Auto	ASMI function error code.
Checksum2 High	36h	Auto	Auto	High byte CMOS checksum of 7Eh-7Fh.
Checksum2 Low	37h	Auto	Auto	Low byte CMOS checksum of 7Eh-7Fh.
Auto Status	38h	Auto	Auto	Automatic configuration reason byte. POST should set this byte 'OR' ed with COMS 0Eh at automatic configuration.
Last APMC command	39h	Auto	Auto	Last SMI code from APMC.
Last KBC command	3Ah	Auto	Auto	Last SMI code from KBC.
SuspMemConf DRAMC	3Bh			Save area of core chip for suspend (3Bh-4Eh)
SuspMemConf DRAMT	3Ch			Save area of core chip for suspend (3Bh-4Eh)
SuspMemConf DRB0	3Dh			Save area of core chip for suspend (3Bh-4Eh)

Name	Adr	Factory default	Setup default (PnP)	Description
SuspMemConf DRB1	3Eh			Save area of core chip for suspend (3Bh-4Eh)
SuspMemConf DRB2	3Fh			Save area of core chip for suspend (3Bh-4Eh)
SuspMemConf DRB3	40h			Save area of core chip for suspend (3Bh-4Eh)
SuspMemConf DRB4	41h			Save area of core chip for suspend (3Bh-4Eh)
SuspMemConf DRB5	42h			Save area of core chip for suspend (3Bh-4Eh)
SuspMemConf DRB6	43h			Save area of core chip for suspend (3Bh-4Eh)
SuspMemConf DRB7	44h			Save area of core chip for suspend (3Bh-4Eh)
SuspMemConf RPS0	45h			Save area of core chip for suspend (3Bh-4Eh)
SuspMemConf RPS1	46h			Save area of core chip for suspend (3Bh-4Eh)
SuspMemConf SDRAM0	47h			Save area of core chip for suspend (3Bh-4Eh)
SuspMemConf SDRAM1	48h			Save area of core chip for suspend (3Bh-4Eh)
SuspMemConf PGPOL0	49h			Save area of core chip for suspend (3Bh-4Eh)
SuspMemConf PGPOL1	4Ah			Save area of core chip for suspend (3Bh-4Eh)
SuspMemConf NBXCFG0	4Bh			Save area of core chip for suspend (3Bh-4Eh)
SuspMemConf NBXCFG1	4Ch			Save area of core chip for suspend (3Bh-4Eh)
SuspMemConf NBXCFG2	4Dh			Save area of core chip for suspend (3Bh-4Eh)
SuspMemConf NBXCFG3	4Eh			Save area of core chip for suspend (3Bh-4Eh)
MTSCL2_Q_BOOT P1 Cache Type Cache Video Buffer	4Fh	01h	01h	Bit7-3: Reserved Bit2: Cache Video Buffer Bit1: P1 Cache Type Bit0: Quick Boot enable
Memory Row Disable Low	50h	00h	00h	Bit7-4: MemoryRowDisable1 Bit3-0: MemoryRowDisable0
Memory Row Disable Low	51h	00h	00h	Bit7-4: MemoryRowDisable3 Bit3-0: MemoryRowDisable2
Memory Row Disable High	52h	00h	00h	Bit7-4: MemoryRowDisable5 Bit3-0: MemoryRowDisable4
Memory Row Disable High	53h	00h	00h	Bit7-4: MemoryRowDisable7 Bit3-0: MemoryRowDisable6
Layout High	7Eh			BIOS internal use only.
Layout Low	7Fh			BIOS internal use only.
Checksum3 High	80h	Auto	Auto	High byte CMOS checsum of D6h-FFh.
Checksum3 Low	81h	Auto	Auto	Low byte CMOS checsum of D6h-FFh.
ACPI Wakeup Event	82h	00h	00h	ACPI Wakeup Event
ACPI Alarm Minutes	83h	00h	00h	ACPI Alarm Minutes
ACPI Alarm Hour	84h	00h	00h	ACPI Alarm Hour
ACPI Alarm Date	85h	00h	00h	ACPI Alarm Date
ACPI Alarm Configuration	86h	00h	00h	ACPI Alarm Configuration
Country ZV Status User Password Entered Supervisor Password Entered	87h	00h	00h	Bit7: Supervisor password Entered Bit6: User Password Entered Bit5:ZV Status Bit4-0: Country (Depend on country model) 00h: US 16h: JP
PnP ISA port bitmap	88h	00h	00h	Bit7: ISA I/O port 11Ch-11Fh Bit6: ISA I/O port 118h-11Bh ... Bit1: ISA I/O port 104h-107h Bit0: ISA I/O port 100h-103h
PnP ISA port bitmap	...	00h	00h	...
PnP ISA port bitmap	9Fh	00h	00h	Bit7: ISA I/O port 3FCh-3FEh Bit6: ISA I/O port 3F8h-3FBh ... Bit1: ISA I/O port 3E4h-3E7h Bit0: ISA I/O port 3E0h-3E3h
PnP ISA port bitmap	A0h	00h	00h	Bit7: ISA I/O port F44h-F48h Bit6: ISA I/O port F40h-F44h Bit5: ISA I/O port E84h-E88h Bit4: ISA I/O port E80h-E83h

Name	Adr	Factory default	Setup default (PnP)	Description
PnP ISA port bitmap	A0h	00h	00h	Bit3: ISA I/O port 608h-60Bh Bit2: ISA I/O port 604h-607h Bit1: ISA I/O port 534h-537h Bit0: ISA I/O port 530h-533h
PnP ISA RAM bitmap	A1h A2h	0000h	0000h	Bit15: (Reserved) Bit14: RAM F Bit13: RAM E Bit12: RAM D Bit11: RAM C Bit10: RAM B Bit9: RAM A Bit8: RAM 9 Bit7: RAM 8 Bit6: RAM 7 Bit5: RAM 6 Bit4: RAM 5 Bit3: RAM 4 Bit2: RAM 3 Bit1: RAM 2 Bit0: RAM 1
PnP ISA ROM bitmap	A3h	00h	00h	Bit7: ROM BC000h-BFFFFh Bit6: ROM B8000h-BBFFFh Bit5: ROM B4000h-B7FFFh Bit4: ROM B0000h-B3FFFh Bit3: ROM AC000h-AFFFFh Bit2: ROM A8000h-ABFFFh Bit1: ROM A4000h-A7FFFh Bit0: ROM A0000h-A3FFFh
PnP ISA ROM bitmap	A4h	00h	00h	Bit7: ROM CE000h-CFFFFh Bit6: ROM CC000h-CDFFFh Bit5: ROM CA000h-CBFFFh Bit4: ROM C8000h-C9FFFh Bit3: ROM C6000h-C7FFFh Bit2: ROM C4000h-C5FFFh Bit1: ROM C2000h-C3FFFh Bit0: ROM C0000h-C1FFFh
PnP ISA ROM bitmap	A5h	00h	00h	Bit7: ROM DE000h-DFFFFh Bit6: ROM DC000h-DDFFFh Bit5: ROM DA000h-DBFFFh Bit4: ROM D8000h-D9FFFh Bit3: ROM D6000h-D7FFFh Bit2: ROM D4000h-D5FFFh Bit1: ROM D2000h-D3FFFh Bit0: ROM D0000h-D1FFFh
PnP ISA DMA bitmap	A6h	00h	00h	Bit7: ISA DMA 7 Bit6: ISA DMA 6 ... Bit1: ISA DMA 1 Bit0: ISA DMA 0
PnP ISA IRQ bitmap	A7h A8h	0000h	0000h	Bit15: ISA IRQ F Bit14: ISA IRQ E ... Bit1: ISA IRQ 1 Bit0: ISA IRQ 0
Save COM	A9h	00h	00h	Save area of COM Address for PnP BIOS
Save COM Save IrDA	AAh	00h	00h	Bit7-5: Save area of IrDA DMA1 for PnP BIOS Bit4: Save area of COM Status for PnP BIOS Bit3-0: Save area of COM IRQ for PnP BIOS

Name	Adr	Factory default	Setup default (PnP)	Description
Save IrDA	ABh	00h	00h	Bit7-4: Save area of IrDA IRQ for PnP BIOS Bit3: Save area of IrDA Status for PnP BIOS Bit2-0: Save area of IrDA DMA2 for PnP BIOS
Save IrDA	ACh	00h	00h	Save area of IrDA Address for PnP BIOS
Save LPT	ADh	00h	00h	Save area of LPT Address for PnP BIOS
Save LPT	AEh	00h	00h	Bit7: Save area of LPT Status for PnP BIOS Bit6-4: Save area of LPT DMA for PnP BIOS Bit3-0: Save area of LPT IRQ for PnP BIOS
Save Sound	AFh	00h	00h	Bit7-6: Save area of Sound MPU Address for PnP BIOS Bit5-4: Save area of Sound CTRL Address for PnP BIOS Bit3-2: Save area of Sound MSS Address for PnP BIOS Bit1-0: Save area of Sound SB Address for PnP BIOS
Save Sound	B0h	00h	00h	Bit7-4: Save area of Sound IRQ2 for PnP BIOS Bit3-0: Save area of Sound IRQ1 for PnP BIOS
Save Sound	B1h	00h	00h	Bit7-6: Save area of Sound FM Address for PnP BIOS Bit5-3: Save area of Sound DMA2 for PnP BIOS Bit2-0: Save area of Sound DMA1 for PnP BIOS
Save Sound Suppress Win95 Warning DU Status L1 Cache Enable L2 Cache Enable Quiet boot Turbo	B2h	B2h	B2h	Bit7: Turbo Bit6: Quiet Boot Enable Bit5: L1 Cache Enable Bit4: L2 Cache Enable Bit3-2: DU Status Bit3=1: External Video card exist in DU Bit2=1: DU exist Bit1: Suppress Win 95 Warning Bit0: Save area of Sound Status for PNP BIOS
PnP System IRQ bitmap	B3h B4h	0000h	0000h	Bit15: System IRQ F Bit14: System IRQ E ... Bit1: System IRQ 1 Bit0: System IRQ 0 *Note: "System" means these resource used by POST.*
PnP System DMA bitmap	B5h	00h	09h	Bit7: System DMA 7 Bit6: System DMA 6 ... Bit1: System DMA 1 Bit0: System DMA 0 *Note: "System" means these resource used by POST.*
LCD Contrast	B6h	Not Touch	Not Touch	Reserved
LCD Bright Resume Factor	B7h	05h	05h	Bit7-3: Resume Factor from suspend Bit7=1: Memory Checksum error Bit6=1: DU error (Reserved) Bit5=1: LCD type error (Reserved) Bit4=1: Memory Card error (Reserved) Bit3=1: SMI signature error Bit2-0: LCD Brightness boot up value (Not Touch) *Note: These bits are set at Fn+F2 and used at boot time.*
SR MeaSum	B8h B9h	0000h	0000h	BIOS Internal use only
Video Memory	BAh BBh	0000h	0020h	Video memory size, in 64 KB unit (Reserved)
Diskette Controller Parallel Error Serial Error IDE Controller Primary IDE Controller Secondary L2 Cache Size	BCh	31h	31h	Bit7-6: L2 Cache Size (Low 3 bits) Bit5: IDE Controller Secondary Bit4: IDE Controller Primary Bit3-2: Serial Error Bit3: SerialB error Bit2: SerialA error Bit1: Parallel Error Bit0: Diskette Controller

Name	Adr	Factory default	Setup default (PnP)	Description
Reserved	BDh ~ BFh	00h	00h	Reserved
SerialA Device Mode IRQ Parallel Device Mode IRQ	C0h	00h	00h	Bit7-4: Parallel Device Mode IRQ Bit3-0: SerialA Device Mode IRQ
16PCIC Second	D3h	00h	00h	Bit7: Second PCIC mode (16 Bit PCMCIA Compatible Mode) =0: CardBus Controller 2 = 32 bit mode =1: CardBus Controller 2 = 16 bit mode
COM3 Address	D4h	00h	00h	COM3 Address *Note: Actual address of COM3 used 10 bits, these 8 bits indicate bit 2-bit 9 of actual address. bit 1-0 are set to 0.*
COM3 IRQ COM3 PnP mode COM3 Disable COM2 mode	D5h	00h	00h	Bit7-6: COM2 mode =00: IrDA =01: PR =02: modem Bit5: COM3 disable Bit4: COM3 PnP mode Bit3-0: COM3 IRQ number
Ring Resume Second CardBus Controller RESUME ELCR Internal CardBus Controller CDD Speed (MAX) Bios Update Sleep Switch Status	D6h	00h	00h	Bit7-6: Sleep Switch Status Bit7=Suspend Enable =1: Enable =0: Disable Bit6=Hibernation Enable =1: Enable =0: Disable Bit5=Bios Update Enable =1: Disable =0: Enable Bit4=CDD Speed (MAX) =0: 12x speed =1: 24x speed Bit3=Internal CardBus Controller =1: Enable =0: Disable Bit2: RESUME ELCR Bit1: Second CardBus Controller =1: Enable =0: Disable Bit0: Ring Resume =1: Enable =0: Disable
CRT Required Floppy Required Palette Snoop Enable PS2 Mouse Wake on LAN Enable LAN Controller CardBus Init 16PCIC	D7h	3Bh	3Bh	Bit7: CMOS-_16_PCIC (16 Bit PCMCIA Compatible Mode) =0: CardBus Controller 1 = 32 bit mode =1: CardBus Controller 1 = 16 bit mode Bit6: CardBus Init Enable Bit5: LAN Controller Bit4: Wake on LAN Enable Bit3: PS2 Mouse Bit2: Palette Snoop Enable Bit1: Floppy Required =1: Display floppy error when error is detected at POST =0: Error message is never displayed even if floppy error is detected at POST Bit0: CRT Required
Sound	D8h	05h	05h	Bit7-4: Sound IRQ2 Number Bit3-0: Sound IRQ1 Number
Sound	D9h	20h	20h	Bit7-6: Sound control base address =00: 370h

Name	Adr	Factory default	Setup default (PnP)	Description
				=01: 372h =10: 380h =11: 382h Bit5-3: Sound DMA2 Bit2-0: Sound DMA1
Sound	DAh	00h	00h	Bit7-6: ROMSETUP Sound Settings (Low 2 bits) Bit5-4: WSS CODEC (Microsoft Sound System) I/O base address =00b: 530h =01b: 604h =10b: E80h =11b: F40h Bit3-2: Sound FM base address =00: 388h =01: 398h =10: 3A0h =11: 3A8h Bit1-0: MPU base address =00: 300h =01: 310h =10: 320h =11: 330h
Sound IrDA	DBh	71h	71h	Bit7-5: IrDA DMA2 Bit4-2: irDA DMA1 Bit1: Sound Disable Bit0: ROSMETUP Sound Settings (High 1 bit)
IrDA	DCh	5Fh	5Fh	IrDA Address
IrDA Speaker Disable Internal Pointing Device Disable	DDh	0Dh	0Dh	Bit7: Internal Pointing Device Disable Bit6: Speaker Disable Bit5-2: IrDA IRQ Bit1: IrDA Disable Bit0: IrDA PnP mode
VGA	DEh	E8h	E8h	Bit7-6: Initial display device =00: (Reserved) =01: Internal LCD =10: External Monitor (CRT) =11: Simultaneous Bit5: SVGA LCD Text expansion Bit4: XGA LCD Text expansion Bit3: VGA LCD Text expansion Bit2: SVGA LCD Graphic expansion Bit1: XGA LCD Graphic expansion Bit0: VGA LCD Graphic expansion
CBP Enable CBP Keys ACPI PnP OS ECP DMA	DFh	A0h	A0h	Bit7: ECP DMA number (LOW 1bits) Bit6-5: PnP OS =00: Legacy OS =01: Windows 95 =11: Future Windows Bit4: ACPI BIOS Bit3: ACPI Hardware Signature Override Bit2-1: Coffee break Password key combination =00: Alt+Ctrl+F9 =01: Alt+Ctrl+F10 =10: Alt+Ctrl+F11 =11: Alt+Ctrl+F12 Bit0: Coffee break Password Enable
ECP DMA LPT IRQ Parallel mode	E0h	9Ch	9Ch	Bit7-6: Parallel mode (LOW 2 bits) =001: Unidirectional (SPP) =010: Bidirectional (Standard)

Name	Adr	Factory default	Setup default (PnP)	Description
				=011: ECP Bit5-2: LPT IRQ number Bit1-0: ECP DMA number (High 2 bits)
Parallel mode ROMSET Parallel ROMSET Serial	E1h	9Ah	9Ah	Bit7: Serial PnP mode Bit6-4: Serial =000: Disable =001: 3F8 Bit3: Parallel PnP mode Bit2-1: Parallel =00: Disable =01: 378 =11: 3BC Bit0: Parallel mode (High 1 bit)
HD mode	E2h	00h	00h	HD mode (LOW 8 bits)
HD mode HD Auto	E3h	F0h	F0h	Bit7-4: HD auto Bit3-0: HD mode (High 4 bits)
Memory 16M to 4G	E4h E5h	Auto	Auto	Extended memory size. Unit is 64 Kbytes. Set correct value if memory size is between 16 MB and 64 MB.
Non Parity Memory SRAM Type Stop Clock Power Saving HDC SMI	E6h	D4h	D4h	Bit7: HDC accese in SNT =1: Enable =0: Disable Bit6-4: Power Saving =111b: Custom =110b: Advanced =101b: Standard (Battery/AC Adapter) =001b: Standard (Battery) =000b: OFF Bit3: Stop clock Bit2-1: SRAM type Bit0: Non Parity Memory (Reserved)
BDA SMI Green PC Allow Standby with AC Allow Standby with AC APM Version Power Switch Status	E7h	3Fh	3Fh	Bit7-6: Power Switch Status Bit7: Suspend Enable =1: Enable =0: Disable Bit6: Hibernation Enable =1: Enable =0: Disable Bit5-4: APM support version =00: APM disable =01: APM 1.0 =10: APM 1.1 =11: APM 1.2 Bit3: Allow auto Suspend with AC IN =1: Enable =0: Disable Bit2: Allow auto Standby with AC IN =1: Enable =0: Disable Bit1: Green PC Bit0: BDA access in SMI =1: Enable =0: Disable
Standby Timer with AC	E8h	18h	18h	Standby time out with AC value, unit=5sec 00h=disable (never standby off)
Standby Timer with DC	E9h	18h	18h	Standby time out with DC value, unit=5sec 00h=disable (never standby off)
Suspend Timer	EAh	30h	30h	Auto-Hibernation time out value, unit=5sec 00h=disable (never auto-suspend)

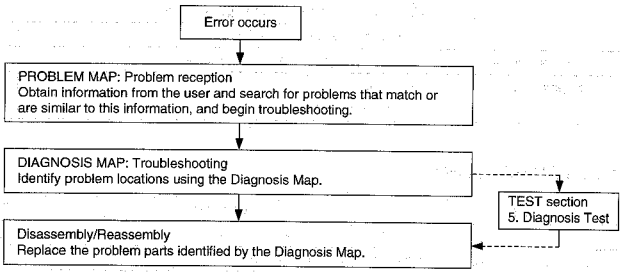
Name	Adr	Factory default	Setup default (PnP)	Description
HDD motor off Timer	EBh	0Ch	0Ch	HDD motor off time out value, unit=5sec 00h=disable (never HDD off)
CDD motor off Timer	ECh	0Ch	0Ch	CDD motor off time out value, unit=5sec 00h=disable (never CDD off)
Supervisor Password Checksum	EDh	00h	Not Touch	Supervisor Password Checksum
Supervisor Password	EEh	00h	Not Touch	Supervisor Password byte 0 (LSB) with zeros (00) *Note: Could be less than 7 characters; in that case, CMOS if filled with zeros (00)* *Note: Bit7 is reserved as 0b* *Note: POST should do Automatic Configuration only when RTC Lost power error is occurred.*
Supervisor Password	EFh	00h	Not Touch	Supervisor Password byte 1
Supervisor Password	F0h	00h	Not Touch	Supervisor Password byte 2
Supervisor Password	F1h	00h	Not Touch	Supervisor Password byte 3
Supervisor Password	F2h	00h	Not Touch	Supervisor Password byte 4
Supervisor Password	F3h	00h	Not Touch	Supervisor Password byte 5
Supervisor Password	F4h	00h	Not Touch	Supervisor Password byte 6
User Password Checksum	F5h	00h	Not Touch	User Password Checksum
User Password	F6h	00h	Not Touch	User Password byte 0 (LSB) See the note of index EEh (Supervisor Password)
User Password	F7h	00h	Not Touch	User Password byte 1 See the note of index EEh (Supervisor Password)
User Password	F8h	00h	Not Touch	User Password byte 2 See the note of index EEh (Supervisor Password)
User Password	F9h	00h	Not Touch	User Password byte 3 See the note of index EEh (Supervisor Password)
User Password	FAh	00h	Not Touch	User Password byte 4 See the note of index EEh (Supervisor Password)
User Password	FBh	00h	Not Touch	User Password byte 5 See the note of index EEh (Supervisor Password)
User Password	FCh	00h	Not Touch	User Password byte 6 See the note of index EEh (Supervisor Password)
Keyboard Speed Keyboard Required Num Lock User Password change Supervisor Password is installed Server mode User Password installed USB Enable	FDh	0Bh	0Bh	Bit7: USB Enable Bit6: User password is installed Bit5: Server mode (Reserved) Bit4: Supervisor password is installed Bit3: Allow User Password Change Bit2: Num Lock (Depend on country model) =1: Num Lock is off at boot =0: Num Lock is on at boot Bit1: Keyboard error required (Reserved) =1: Display keyboard error when error is detected at POST =0: Error message is never displayed even if keyboard error is detected at POST Bit0: Keyboard typematic rate and delay =1: 30 characters/sec, 250msec delay =0: 10.9 characters/sec, 500msec delay

Name	Adr	Factory default	Setup default (PnP)	Description
Boot Device	FEh	80h	80h	Bit7-4, Boot device 2 Bit3-0, Boot device 1 *Note: Each nibble is device number. If MSB=1, Fixed disk drive.*
Boot Device	FFh	00h	00h	Bit7-4, Boot device 4 Bit3-0, Boot device 3 Refer to the note of CMOS index F0h

4. Diagnosis Procedure

4.1 Outline of Diagnosis Procedure

If an error message is received from the unit, verify the location of the error in the Problem Map, and select the Diagnosis Map where the cause appears to be located.
Separate the problem locations in the Diagnosis Map, and replace the problem parts identified with the Diagnosis Map.

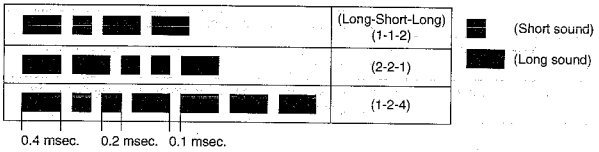

Error occurs
PROBLEM MAP: Problem reception
Obtain information from the user and search for problems that match or are similar to this information, and begin troubleshooting.
DIAGNOSIS MAP: Troubleshooting
Identify problem locations using the Diagnosis Map.
TEST section
5. Diagnosis Test
Disassembly/Reassembly
Replace the problem parts identified by the Diagnosis Map.

4.2 Problem Map

4.2.1 POST (Power on self test) ERROR

1) Startup Error Codes (Refer to pages 4-5, 4-6).
   During POST (power on self test) error codes may be displayed.
   They are also displayed if a hardware failure occurs.

2) Beep Error Codes (Refer to page 4-7).
   Three examples of beep sounds are shown below.
   Length of bar shows sound duration.



4.2.2 MAIN UNIT PROBLEM

Problem	Symptom	Ref. Page
Power problem	No power is sent to the unit.	4-8
	Power cuts off during operation.	4-8
Boot problem	When a device is selected for "Boot Up Drive", the system boots from a different device.	4-9
Date or Clock problem	Date or Time cannot be input.	4-9
	Date and Time does not change properly.	4-9
	Date and Time are not displayed.	4-9
Memory problem	Memory count is too large or too small.	4-9
Speaker problem	No sound	4-9
	Volume does not work.	4-9

4.2.3 LCD PROBLEM

Problem	Symptom	Ref. Page
LCD does not display	No picture appears on the screen.	4-10
LCD display problem	Display is too dark or too bright.	4-10
	Part of the screen does not display properly. Display quality poor. (Fuzzy or slanted, etc.)	4-10
	Backlight does not turn on.	4-10

4.2.4 KEYBOARD, TRACK BALL or MOUSE PROBLEM

Problem	Symptom	Ref. Page
Keyboard problem	Key top cannot be pressed. Key top does not spring back after pressing.	4-11
	None of the keys function. Certain keys do not function.	4-11
	Input character is displayed as garbage.	4-11
Mouse problem	Mouse does not function. Inputs from the mouse are not accepted properly.	4-11
Track Ball problem	Track Ball does not function. Inputs from the track ball are not accepted properly.	4-11

4.2.5 FDD PROBLEM

Problem	Symptom	Ref. Page
FDD problem	Access lamp does not light.	4-12
	Cannot insert floppy disk. Cannot remove floppy disk.	4-12
	Does not boot from FDD.	4-12
	Cannot read from floppy disk. Cannot write to floppy disk.	4-12
	Floppy disk is scratched or otherwise damaged. Content of floppy disk is destroyed.	4-12
	Damage to contents written to floppy disk. Damage to contents read from floppy disk.	4-12
	Abnormal sound.	4-12
	Diagnostic Test reports problem in FDC.	4-12

4.2.6 HDD PROBLEM

Problem	Symptom	Ref. Page
HDD problem	Does not boot from HDD.	4-13
	Cannot read from HDD. Cannot write to HDD.	4-13
	Damage to data written to HDD. Damage to data read from HDD. HDD contents are destroyed.	4-13
	Diagnostic Test reports problem in HDC or HDD.	4-13
	Access lamp does not light.	4-13
	Abnormal sound.	4-13

4.2.7 SERIAL COMMUNICATION PROBLEM

Problem	Symptom	Ref. Page
Transmission problem	Data cannot be sent or received.	4-14
	Unit will not communicate with another computer when connected directly.	4-14
	Unit will not communicate with modem.	4-14
	Diagnostic Test reports problem in serial port.	4-14

4.2.8 PRINTING PROBLEM

Problem	Symptom	Ref. Page
Printing problem	Data does not print.	4-15
	Data prints out incorrectly.	4-15
	The unit hangs after outputting data from the printer.	4-15
	Print area is out line.	4-15
	Data is printed all on one line. (Carriage return does not work.)	4-15

4.2.9 CD-ROM Drive PROBLEM

Problem	Symptom	Ref. Page
CD-ROM Drive problem	Access lamp does not light.	4-15
	Cannot read from CD-ROM disk.	4-15
	Abnormal sound.	4-15

4.2.10 INFRARED COMMUNICATION PORT PROBLEM

Problem	Symptom	Ref. Page
Transmission problem	Data cannot be sent or received.	4-16
	Transmitted data becomes corrupted.	4-16

4.3 Diagnosis Map

4.3.1 Startup Error Code

No.	Error Code	Description	Troubleshooting procedures No.	Troubleshooting procedures	Result	Source of problem	Component	Ref. Page Schematic Diagrams
1	062	Default configuration in use	1-1	Check configuration.	—	Configuration	—	—
2	101	Interrupt controller failure	2-1	———	—	Main PCB	IC11	Main 9, 10
3	102	Timer failure	3-1	———	—	Main PCB	—	—
4	106	FDC failure	4-1	———	—	Main PCB	IC11 IC19	Main 9, 10 Main 16
5	114	Expansion card ROM checksum error	5-1	Does the system return to normal if the expansion card is removed?	YES	Go to No. 5-2	—	—
					NO	Main PCB	IC11 IC5	Main 9, 10 Main 4, 5
			5-2	Replace the expansion card. Does operation return to normal?	YES	Expansion card	—	—
					NO	Main PCB	—	—
6	151	Real Time Clock failure	6-1	———	—	Main PCB	IC11	Main 9, 10
7	161	Dead RTC Battery	7-1	Does resetting through SETUP correct the problem?	YES	Error during SETUP	—	—
					NO	Go to No. 7-2	—	—
			7-2	Replace the battery. Does operation return to normal?	YES	Battery	BT1	Main 10
					NO	Main PCB	IC11	Main 9, 10
8	162	Configuration error	8-1	Check configuration.	—	Configuration	—	—
9	162	CMOS Checksum error	9-1	Were the correct settings selected during SETUP?	YES	Go to No. 9-2	—	—
					NO	Go to No. 9-4	—	—
			9-2	Replace the FDD. Does operation return to normal?	YES	FDD	—	—
					NO	Go to No. 9-3	—	—
			9-3	Replace the HDD. Does operation return to normal?	YES	HDD	—	—
					NO	Go to No. 9-4	—	—
			9-4	Does resetting through SETUP correct the problem?	YES	Error during SETUP	—	—
					NO	Main PCB	IC11 X2	Main 9, 10 Main 9
10	163	Real time Clock is not updating	10-1	Does resetting the date/time in SETUP correct the problem?	YES	Error during SETUP	—	—
					NO	Main PCB	IC11	Main 9, 10
11	173	CMOS checksum error	11-1	———	—	Main PCB	—	—
12	201	Memory size/data error	12-1	Replace the expansion RAM card. Does operation return to normal? (Go to "NO" if not connected.)	YES	Expansion RAM card	—	—
					NO	Main PCB	IC5 IC7～10	Main 4, 5 Main 7
13	301	Keyboard failure	13-1	Is the keyboard properly connected?	YES	Go to No. 14-1	—	—
					NO	Keyboard was not connected properly	—	—
14	301	Keyboard interface failure	14-1	Replace the keyboard. Does operation return to normal?	YES	Keyboard	—	—
					NO	Main PCB	IC23	Main 18

No.	Error Code	Description	Troubleshooting procedures No.	Troubleshooting procedures	Result	Source of problem	Component	Ref. Page Shematic Diagrams
15	604 605	FDC failure	15-1	Replace the FDD. Does operation return to normal?	YES	FDD	—	—
					NO	Go to No. 15-2	—	—
			15-2	Replace the FDD FPC. Does operation return to normal?	YES	FDD FPC	—	—
					NO	Main PCB	IC19	Main 16
16	1780	Hard disk failure	16-1	Does executing FDISK correct the problem?	YES	Format data destroyed	—	—
					NO	Go to No. 16-2	—	—
			16-2	Replace the HDD. Does operation return to normal?	YES	HDD	—	—
					NO	Go to No. 16-2	—	—
			16-3	Replace the HDD cable. Does opration return to normal?	YES	HDD cable	—	—
					NO	Main PCB	IC11	Main 9, 10
17	1800 { 1805	PCI failur	17-1	Does the system return to normal if the expansion card is removed?	YES	Go to No. 17-2	—	—
					NO	Main PCB	IC5	Main 4, 5
			17-2	Replace the expansion card. Does operation return to normal?	YES	Expansion card	—	—
					NO	Main PCB	IC5	Main 4, 5
18	1962	An operating system could not be found	18-1	Does executing FDISK correct the problem?	YES	Format data destroyed	—	—
					NO	Go to No. 18-2	—	—
			18-2	replace the HDD . Does operation return to normal?	YES	HDD	—	—
					NO	Go to No. 18-3	—	—
			18-3	Replace the HDD cable. Does operation return to normal?	YES	HDD cable	—	—
					NO	Main PCB	IC11	Main 9, 10
19	8601	Position device failure	19-1	Replace the mouse. Does operation return to normal?	YES	Mouse	—	—
					NO	Go to No. 19-2	—	—
			19-2	Replace the track ball. Does operation return to normal?	YES	Track ball	—	—
					NO	Main PCB	IC23	Main 18
20	1999 0301	Hard disk failure	20-1	Does executing FDISK correct the problem?	YES	Format data destroyed	—	—
					NO	Go to No. 20-2	—	—
			20-2	Replace the HDD. Does operation return to normal?	YES	HDD	—	—
					NO	Go to No. 20-3	—	—
			20-3	Replace the HDD cable. Does operation return to normal?	YES	HDD cable	—	—
					NO	Main PCB	IC11	Main 9, 10
21	1999 0305	An operating system could not be found	21-1	Does executing FDISK correct the problem?	YES	Format data destroyed	—	—
					NO	Go to No. 21-2	—	—
			21-2	Replace the HDD. Does operation return to normal?	YES	HDD	—	—
					NO	Go to No. 21-3	—	—
			21-3	Replace the HDD cable. Does operation return to normal?	YES	HDD cable	—	—
					NO	Main PCB	IC11	Main 9, 10

4.3.2 Beep Error Code

No.	Beep Sound	Description	Source of problem	Component	Ref. Page Shematic Diagrams
1	1-1-2	CPU register test failure	Main PCB	CPU	——
2	1-1-3	CMOS write/read test failure		IC11	Main 9, 10
3	1-1-4	BIOS ROM checksum failure		IC11 IC40	Main 9, 10 Main 25
4	1-2-1	Programmable Interval Timer test failure		IC11	Main 9, 10
5	1-2-2	DMA initialization test in progress or failure		IC11	Main 9, 10
6	1-2-3	DMA page register write/read test in progress or failure		IC11	Main 9, 10
7	1-2-4	RAM refresh verification failure		IC5	Main 4, 5
8	1-3-1	1st 64K RAM test failure		IC7~10 IC5	Main 7 Main 4, 5
9	1-3-3	Slave DMA register test in progress or failure		IC11	Main 9, 10
10	1-3-4	Master DMA register test in progress or failure		IC11	Main 9, 10
11	1-4-1	Master interrupt mask register test failure		IC11	Main 9, 10
12	1-4-2	Slave interrupt mask register test failure		IC11	Main 9, 10
13	1-4-3	Interrupt vector loading failure		IC11	Main 9, 10
14	1-4-4	Keyboard controller test failure		IC23 IC11	Main 18 Main 9, 10
15	2-1-3	Screen initialization in progress		IC13 IC7~10	Main 12 Main 7
16	2-1-4	Screen memory test in progress		IC13	Main 12
17	2-2-1	Screen retrace tests in progress		IC13	Main 12
18	2-2-2	Search for video ROM in progress		IC11	Main 9, 10
19	2-2-4	Timer tick interrupt test in progress or failure		IC11	Main 9, 10
20	2-3-1	Interval timer channel 2 test in progress or failure		IC11	Main 9, 10
21	2-3-2	RAM test in progress or failure above address 0FFFFH		IC5 IC7~10	Main 4, 5 Main7
22	2-3-3	Time-of-Day clock test failure		IC11 X2	Main 9, 10 Main 9
23	2-3-4	Serial port test test in progress or failure		IC11 IC19	Main 9, 10 Main 16
24	2-4-1	Parallel port test test in progress or failure		IC11 IC19	Main 9, 10 Main 16
25	2-4-2	Math Coprocessor test in progress or failure		CPU IC11	—— Main 9, 10

4.3.3 MAIN UNIT DIAGNOSIS (1/2)

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symptom	Troubleshooting procedures No.	Troubleshooting procedures	Result	Source of problem	Component	Ref. Page Shematic Diagrams
1	No power is sent to the unit. (when using AC)	1-1	Is 15V applied to pins 5-8 of Q51? (Whichever one)?	YES	Go to No. 1-6	——	——
				NO	Go to No. 1-2	——	——
		1-2	Is 15V applied to pins 1 of Q51?	YES	Go to No. 1-5	——	——
				NO	Go to No. 1-3	——	——
		1-3	Is 15V applied to pins 1 of Q48?	YES	Go to No. 1-4	——	——
				NO	If resistance across L99 terminals is not lower than 1Ω	L99	Main 30
					If lower than 1Ω	D30	Main 30
		1-4	Is voltage pin 4 of Q48 lower than 1V?	YES	——	Q48	Main 30
				NO	If voltage pin 3 of D27 is 15V	R377 Q47	Main 30
					If lower than 15V	D27	Main 30
		1-5	Is voltage pin 4 of Q51 lower than 1V?	YES	——	Q51	Main 30
				NO	If voltage pin 3 of D27 is 15V	Q50	Main 30
					If lower than 15V	D33, D34 D35, D36 D37	Main 30
		1-6	Before setting the power switch to ON, check voltage on either side of R376. Is Voltage 5V?	YES	If voltage is 0V during the power switch is set to ON, go to No. 1-7	——	——
					If not 0V	SW2	Main 30
				NO	If voltage of C386 is 3V	R379	Main 30
					If lower than 3V	IC48	Main 29
		1-7	Final Means	—	Main PCB	IC48	Main 29
	No power is sent to the unit, (When using the Battery Pack)	1-8	Is 8~12V applied to pins 5~8 of Q51? (Whichever one)	YES	Go to No. 1-6	——	——
				NO	Go to No. 1-5	——	——
2	Power cuts off during operation.	2-1	Check soldered parts of R327, 328, 329, 342, 343, 357 and R358.	NO	If they show soldered completely	R327, R328 R329, R342 R343, R357 R358	Main 28 Main 29
				YES	——	IC48	Main 29

4.3.4 MAIN UNIT DIAGNOSIS (2/2)

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symptom	Troubleshooting procedures No.	Troubleshooting procedures	Result	Source of problem	Component	Ref. Page Schematic Diagrams
1	When a device is selected for "Boot Up Drive", the system boots from a different device.	1-1	Are there system files in the device selected?	YES	Go to No. 1-2	—	—
				NO	Improper setting	—	—
		1-2	Does the unit operate normally after replacing the problem device.	YES	Device for which the problem occurred	—	—
				NO	Main PCB	(HDD) IC11	Main 9, 10
						(FDD) IC11 IC19	Main 9, 10 Main 16
2	Date or Time cannot be input. Date and Time does not change properly. Date and Time are not displayed.	2-1	Replace the Main PCB.	—	Main PCB	IC11 X2 BT1	Main 9, 10 Main 9 Main 10
3	Memory count is too large or too small.	3-1	Replace the Main PCB.	—	Main PCB	IC7~10 IC5	Main 7 Main 4, 5
4	No Sound Volume does not work.	4-1	Check software setting.	YES	Software setting	—	—
				NO	Go to No. 4-2	—	—
		4-2	Replace the Speakers. Does operation return to normal?	YES	Speakers	—	—
				NO	Go to No. 4-3	—	—
		4-3	Replace the LCD/Inverter cable. Does operation return to normal?	YES	LCD/Inverter cable	—	—
				NO	Go to No. 4-4	—	—
		4-4	Replace the Main PCB.	—	Main PCB	IC24, D13 IC27	Main 19 Main 20

4.3.5 LCD DIANOSIS

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symptom	Troubleshooting procedures No.	Troubleshooting procedures	Result	Source of problem	Component	Ref. Page Schematic Diagrams
1	No picture appears on the screen.	1-1	Does the LCD display properly after brightness level is adjusted?	YES	Brigntness adjustment	—	—
				NO	Go to No. 1-2	—	—
		1-2	Replace the LCD. Does operation return to normal?	YES	LCD	—	—
				NO	Go to No. 1-3	—	—
		1-3	Replace the Main PCB. Does operation return to normal?	YES	Main PCB	IC13	Main 12
				NO	Go to No. 1-4	—	—
		1-4	Replace the LCD cable. Does operation return to normal?	YES	LCD cable	—	—
				NO	LCD connector PCB	—	—
2	Display is too dark or too bright.	2-1	Does the LCD display properly after brightness level is adjusted?	YES	Brigntness adjustment	—	—
				NO	Go to No. 2-2	—	—
		2-2	Replace the LCD. Does operation return to normal?	YES	LCD	—	—
				NO	Go to No. 2-3	—	—
		2-3	Replace the Main PCB. Does operation return to normal?	YES	Main PCB	CN11 IC42	Main 13 Main 26
				NO	Go to No. 2-4	—	—
		2-4	Replace the LCD cable. Does opration return to normal?	YES	LCD cable	—	—
				NO	LCD connector PCB	—	—
3	Part of the screen does not display properly. Display quality poor. (Fuzzy or slanted, etc.)	3-1	Replace the LCD. Does operation return to normal.	YES	LCD	—	—
				NO	Go to No. 3-2	—	—
		3-2	Replace the Main PCB. Does operation return to normal?	YES	Main PCB	IC13	Main 12
				NO	Go to No. 3-3	—	—
		3-3	Replace the LCD cable. Does operation return to normal?	YES	LCD cable	—	—
				NO	LCD connector PCB	—	—
4	Backlight does not turn on.	4-1	Replace the Inverter PCB. Does operation returnt o normal?	YES	Inverter PCB	—	—
				NO	Go to No. 4-2	—	—
		4-2	Replace the Inverter cable. Does operation return to normal?	YES	Inverter cable	—	—
				NO	Go to No. 4-3	—	—
		4-3	Replace the backlight. Does operation return to normal?	YES	Backlight	—	—
				NO	Main PCB	CN11 IC42	Main 13 Main 26

4.3.6 KEYBOARD, MOUSE or TRACK BALL DIAGNOSIS

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symptom	Troubleshooting procedures No.	Troubleshooting procedures	Result	Source of problem	Component	Ref. Page Schematic Diagrams
1	Key top cannot be pressed. Key top does not spring back after pressing.	1-1	Keyboard is broken.	—	Keyboard	—	—
2	None of the keys function. Certain keys do not function.	2-1	Replace the keyboard and see if inputting from the keyboard function normally?	YES	Keyboard	—	—
				NO	Main PCB	—	—
3	Input character is displayed as grabage.	3-1	Does the screen mode correspond to the key entry mode?	YES	Go to No. 3-2	—	—
				NO	Operating mistake	—	—
		3-2	Is the keyboard setting in the operating system correct?	YES	Go to No. 3-3	—	—
				NO	Software setting	—	—
		3-3	Replace the keyboard and see if inputting from the keyboard functions normally.	YES	Keyboard	—	—
				NO	Main PCB	IC23	Main 18
4	Mouse does not function. Inputs from the mouse are not accepted properly.	4-1	Replace the mouse. Does operation return to normal?	YES	Mouse	—	—
				NO	Main PCB	IC23	Main 18
5	Track ball not function. Input from the track ball are not accepted properly.	5-1	Replace the track ball. Does operation return to normal?	YES	Track Ball	—	—
				NO	Go to No. 5-2	—	—
		5-2	Replace the track ball FPC. Does operation return to normal?	YES	Track Ball FPC	—	—
				NO	Main PCB	IC23	Main 18

4.3.7 FDD DIAGNOSIS

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symptom	Troubleshooting procedures No.	Troubleshooting procedures	Result	Source of problem	Component	Ref. Page Shematic Diagrams
1	Access lamp does not light.	1-1	Replace the FDD. Does operation return to normal?	YES	FDD	—	—
				NO	Go to No. 1-2	—	—
		1-2	Replace the LED PCB. Does operation return to normal?	YES	LED PCB	LD6	LED 1
				NO	Go to No. 1-3	—	—
		1-3	Replace the Main PCB. Does operation return to normal?	YES	Main PCB	IC19	Main 16
				NO	FDD FPC	—	—
2	Cannot insert floppy disk. Cannot remove floppy disk.	2-1	In the floppy disk warped or bent, or labels interfering?	YES	Floppy disk	—	—
				NO	FDD	—	—
3	Does not boot from FDD.	3-1	Are there system files on the media?	YES	Main PCB	IC19	Main 16
				NO	Software	—	—
4	Cannot read from floppy disk. Cannot write to floppy disk.	4-1	Is the floppy disk format correct for the operating system currently being used?	YES	Go to No. 4-2	—	—
				NO	Floppy disk format	—	—
		4-2	Does this occur for a specific floppy disk?	YES	Floppy disk	—	—
				NO	Go to No. 4-3	—	—
		4-3	Try cleaning the disk heads. Does this fix the problem?	YES	Heads were dirty	—	—
				NO	Go to No. 4-4	—	—
		4-4	Replace the FDD. Does operation return to normal?	YES	FDD	—	—
				NO	Go to No. 4-5	—	—
		4-5	Replace the FDD FPC. Does operation return to normal?	YES	FDD FPC	—	—
				NO	Main PCB	IC19	Main 16
5	Floppy disk is scratched or otherwise damaged.	5-1	Try cleaning the disk heads. Does this fix the problem?	YES	Heads were dirty	—	—
				NO	FDD	—	—
6	Content of floppy disk is destroyed.	6-1	Was the eject button pressed while the system was accessing the disk?	YES	Operating mistake	—	—
				NO	Go to No. 6-2	—	—
		6-2	Replace the FDD. Does operation return to normal?	YES	FDD	—	—
				NO	Main PCB	IC19	Main 16
7	Damage to contents written to floppy disk. Damage to contents read from floppy disk.	7-1	Does this occur for a specific floppy disk?	YES	Floppy disk	—	—
				NO	Go to No. 7-2	—	—
		7-2	Replace the FDD. Does operation return to normal?	YES	FDD	—	—
				NO	Go to No. 7-3	—	—
		7-3	Replace the FDD FPC. Does operation return to normal?	YES	FDD FPC	—	—
				NO	Main PCB	IC19	Main 16
8	Abnormal sound.	8-1	Does it sound like the head is moving?	YES	Normal	—	—
				NO	Go to No. 8-2	—	—
		8-2	Does the abnormal sound stop when the motor stops running.	YES	FDD	—	—
				—	—	—	—
9	Diagnostic Test reports problem in FDC.	9-1	Replace the FDD. Does operation return to normal?	YES	FDD	—	—
				NO	Main PCB	IC19	Main 16

4.3.8 HDD DIAGNOSIS

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symptom	Troubleshooting procedures No.	Troubleshooting procedures	Result	Source of problem	Component	Ref. Page Schematic Diagrams
1	Does not boot from HDD.	1-1	Has the HDD been partitioned?	YES	Go to No. 1-2	—	—
				NO	Improper setting	—	—
		1-2	Are there system files on the HDD?	YES	Go to No. 1-3	—	—
				NO	Software on the HDD	—	—
		1-3	Replace the HDD. Does operation return to normal?	YES	HDD	—	—
				NO	Go to No. 1-4	—	—
		1-4	Replace the HDD cable. Does operation return to normal?	YES	HDD cable	—	—
				NO	Main PCB	IC11	Main 9, 10
2	Cannot read from HDD. Cannot write to HDD.	2-1	Has the HDD been formatted?	YES	Go to No. 2-2	—	—
				NO	HDD format	—	—
		2-2	Replace the HDD. Does operation return to normal?	YES	HDD	—	—
				NO	Go to No. 2-3	—	—
		2-3	Replace the HDD cable. Does operation return to normal?	YES	HDD cable	—	—
				NO	Main PCB	IC11	Main 9, 10
3	Damage to data written to HDD. Damage to data read from HDD. HDD contents are destroyed.	3-1	Replace the HDD. Does operation return to normal?	YES	HDD	—	—
				NO	Go to No. 3-2	—	—
		3-2	Replace the HDD cable. Does operation return to normal?	YES	HDD cable	—	—
				NO	Main PCB	IC11	Main 9, 10
4	Dignositic Test reports problem in HDC or HDD.	4-1	Replace the HDD. Does operation return to normal?	YES	HDD	—	—
				NO	Main PCB	IC11	Main 9, 10
5	Access lamp does not light.	5-1	Has the HDD been configured in the OS?	YES	Go to No. 5-2	—	—
				NO	Improper setting	—	—
		5-2	Replace the HDD. Does operation return to normal?	YES	HDD	—	—
				NO	Go to No. 5-3	—	—
		5-3	Replace the LED PCB. Does operation return to normal?	YES	LED PCB	LD7	LED 1
				NO	Go to No. 5-4	—	—
		5-4	Replace the Main PCB. Does operation return to normal?	YES	Main PCB	IC11	Main 9, 10
				NO	HDD cable	—	—
6	Abnormal sound.	6-1	Replace the HDD.	—	HDD	—	—

4.3.9 SERIAL COMMUNICATION DIAGNOSIS

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symptom	Troubleshooting procedures No.	Troubleshooting procedures	Result	Source of problem	Component	Ref. Page Schematic Diagrams
1	Data cannot be sent or received.	1-1	Is the COM port properly set?	YES	Go to No. 1-2	——	——
				NO	Improper setting	——	——
		1-2	Is the same transmission protocol set for both the sending and receiving units?	YES	Go to No. 1-3	——	——
				NO	Improper setting	——	——
		1-3	Does the RS-232C on the Main PCB operate normally under a loopback test?	YES	Check the interface with the other computer	——	——
				NO	Main PCB	IC19 IC22	Main 16 Main 17
2	Unit will not communicate with another computer when connected directly.	2-1	Is the connection cable a dedicated cross-patched cable?	YES	Go to No. 2-2	——	——
				NO	Connection cable	——	——
		2-2	Is the same transmission protocol set for both the sending and receiving units?	YES	Go to No. 2-3	——	——
				NO	Improper setting	——	——
		2-3	Does the RS-232C on the Main PCB operate normally under a reverse test?	YES	Check the interface with the other computer	——	——
				NO	Main PCB	IC19 IC22	Main 16 Main 17
3	Unit will not communicate with modem.	3-1	Is the COM port properly set?	YES	Go to No. 3-2	——	——
				NO	Improper setting	——	——
		3-2	Is the trasmission protocol correct?	YES	Go to No. 3-3	——	——
				NO	Improper setting	——	——
		3-3	Does the modem operate normally under a local analog loopback test?	YES	Line	——	——
				NO	Go to No. 3-4	——	——
		3-4	Does the RS-232C on the main board operate normally under a loopback test?	YES	Modem	——	——
				NO	Main PCB	IC19 IC22	Main 16 Main 17
4	Diagnostic Test reports problem in serial port.	4-1	Is the loop back device properly attached to the connector (for an external loop back)?	YES	Main PCB	IC19 IC22	Main 16 Main 17
				NO	Improper setting	——	——

4.3.10 PRINTING DIAGNOSIS

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symptom	Troubleshooting procedures No.	Troubleshooting procedures	Result	Source of problem	Component	Ref. Page Schematic Diagrams
1	Data does not print from the printer.	1-1	Does the printer pass its self-printing test?	YES	Main PCB	IC19	Main 16
				NO	Printer	—	—
2	Data prints out incorrectly.	2-1	Does the printer pass its self-printing test?	YES	Go to No. 2-2	—	—
				NO	Printer	—	—
		2-2	Is the Parallel Port (Data Direction) setting correct?	YES	Main PCB	IC19	Main 16
				NO	Improper setting	—	—
3	The unit hangs after outputting data from the printer.	3-1	Replace the Main PCB. Does operation return to normal?	YES	Main PCB	IC19	Main 16
				NO	Printer	—	—
4	Print area is out of line.	4-1	Does the printer pass its self-printing test?	YES	Main PCB	IC19	Main 16
				NO	Printer	—	—
5	Data is printed all on one line. (Carriage return does not work.)	4-2	Does the printer pass its self-printing test?	YES	Main PCB	IC19	Main 16
				NO	Printer	—	—

4.3.11 CD-ROM Drive DIAGNOSIS

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symptom	Troubleshooting procedures No.	Troubleshooting procedures	Result	Source of problem	Component	Ref. Page Schematic Diagrams
1	Access lamp does not light.	1-1	Replace the CD-ROM drive. Does operation return to normal?	YES	CD-ROM drive	—	—
				NO	Go to No. 1-2	—	—
		1-2	Replace the LED PCB. Does operation return to normal?	YES	LED PCB	LD5	LED 1
				NO	Go to No. 1-3	—	—
		1-3	Replace the Main PCB. Does operation return to normal?	YES	Main PCB	IC11	Main 9, 10
				NO	CD-ROM FPC	—	—
2	Cannot read from DVD.	2-1	Replace the media. Does operation return to normal?	YES	Media	—	—
				NO	Go to No. 2-2	—	—
		2-2	Replace the CD-ROM drive. Does operation return to normal?	YES	CD-ROM drive	—	—
				NO	Main PCB	IC11	Main 9, 10
3	Tray does not open.	3-1	Replace the CD-ROM drive. Does operation return to normal?	YES	CD-ROM drive	—	—
				NO	Main PCB	IC11	Main 9, 10
4	Abnormal sound.	4-1	Replace the media. Does operation return to normal?	YES	Media	—	—
				NO	CD-ROM drive	—	—

4.3.12 INFRARED COMMUNICATION PORT DIAGNOSIS

Make sure that connecting cables, connectors and AC adapter are not loose or disconnected prior to testing.

No.	Symptom	Troubleshooting procedures No.	Troubleshooting procedures	Result	Source of problem	Component	Ref. Page Shematic Diagrams
1	Data cannot be sent or received.	1-1	Is the Infrared Communication Port enabled in Setup?	YES	Go to No. 1-2	—	—
				NO	Improper setting	—	—
		1-2	Is the same transmission protocol set for both the sending and receiving units?	YES	Go to No. 1-3	—	—
				NO	Improper setting	—	—
2	Transmitted data becomes corrupted.	2-1	Is the transmission distance within 20-50 cm?	YES	Go to No. 2-2	—	—
				NO	Use within specified distance	—	—
		2-2	Is the transmisson path clear of obstacles and interference? Is the unit operated away from TV sets, video, wireles headphones, incandescent lamps or other electronic equipment? Is the unit operated away from direct sunlight?	YES	Main PCB	IC19 IC21	Main 16 Main 16
				NO	Change operating environment	—	—

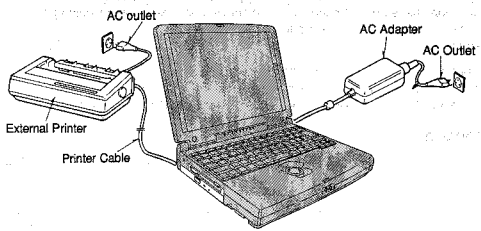
5. Diagnostic Test

5.1 Diagnostic Test Procedure

5.1.1 Equipment

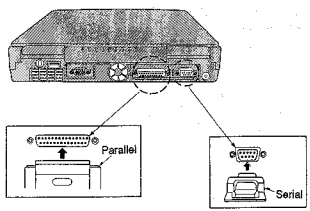
(1) Test Computer..... 1 unit
(2) AC Adapter..... 1 pc.
(3) External Printer..... 1 unit
(4) Loopback Plug (Parallel Port Test) [P/N: DFWV95C0081].....1 pc.
(5) Loopback Plug (Serial Port Test for RS232C) [P/N: DFWV95C0067].....1 pc.
(6) Firstaid FD..... 1 pc.

5.1.2 Equipment Connection



5.1.3 Preparation

(1) Connect the computer as shown in the figure above.
(2) The System Setup should be set to the factory setting values by executing the "SETUP UTILITY" which can be invoked by F1 key at the POST.
If not, the messages and items of the diagnostic test may not be displayed properly on the LCD.
(3) The serial port must be enabled in the "SETUP UTILITY" in order to execute the "1st SERIAL PORT" test.
(4) Connect the serial loopback plug as shown in the figure below.
(5) In order to test the parallel port with Loopback Plug, disconnect the printer cable and connect the parallel loopback plug **with Power OFF** as shown in figure below.



5.1.4 NOTICE

When "Enter password" is displayed, use "Password Skipping Plug" in order to skip the user password.

1) Connect the parallel plug to the parallel port.
2) Connect the PS/2 mouse plug to the mouse port.
3) Power on the CF-45
4) Confirm that the system boots-up without asking a password.
5) Execute "SETUP UTILITY" then press ALT + F10 key at "Load Default Setting (PnP)" is high lighted to reset all setup information.
6) Disconnect plugs

The wiring of the parallel plug is described below.

Connect pins 2-5-6-8-11-13-15-18-19-20-21-22-23 to Shield GND (PS/2 mouse plug pin 3.)
Connect pins 3-4-7-9-10-12 to VC5 (PS/2 mouse plug pin 4) with 4.7KΩ each.

*The jig's specifications have been changed from the conventional password skipping plug. However, it can be used for conventional models.

CAUTION

The plug described above must be used for servicing purpose only.
Do not use it for other than the above purpose and ensure that it remains confidential.
Using the plug enables the user to skip the previous password and disable the password.

5.1.5 Test Procedure

Insert the "Firstaid FD" into the floppy disk drive and restart the computer.

```
1 Boot
2 Restore HDD to Factory defaut
```

Press (1) and (Enter) keys.

```
A: \ WINDOWS \ COMMAND>
```

Input the following;

Press (D)(I)(A)(G)(4)(5) and (Enter) keys.

```
DIAGNOSTIC MENU (V-.-L--)

    1. TEST ALL DEVICES      (■DEVICES)
    2. TEST AUTOMATICALLY (■ DEVICES)
    3. EXIT
  ■ 4. MAIN BOARD
  ■ 5. xxxxxKB RANDOM ACCESS MEMORY
  ■ 6. KEYBOARD
    7. TRACK BALL/MOUSE
  ■ 8. BATTERY PACK
  ■ 9. VIDEO
  ■10. 1 HARD DISK DRIVE(S)
  ■11. 1 FLOPPY DISK DRIVE(S)
    12. 1 PARALLEL PORT(S)
  ■13. 1 SERIAL PORT(S)
  ■14. SOUND
  ■15. PCCARD CONTROLLER
  ■16. INFRARED COMMUNICATION PORT
    17. CD-ROM DRIVE

SELECT MENU : _
```

(Fig, 1)

Select test item, Press number and Enter keys.

1) MAIN BOARD TEST

Fig.1 displayed.
Press (4) and (Enter) keys.
● Display

```
MAIN BOARD TEST
```

(Normal Message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Message].

2) xxxxxKB RANDOM ACCESS MEMORY TEST

Fig.1 displayed.
Press (5) and (Enter) Keys.
● Display

```
BASE RAM TEST
   CURRENT BASE RAM SIZE = 640KB
   640KB  OK
EXTENDED RAM TEST
   CURRENT EXTENDED RAM SIZE = xxxxxKB
   xxxxxKB  OK
```

(Normal Message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Message].

3) KEYBOARD TEST

Fig.1 displayed.
Press (6) and (Enter) keys. Fig.2 displayed.
● Display

```
KEYBOARD
      1. TEST ALL DEVICES      (■DEVICES)
      2. TEST AUTOMATICALLY (■DEVICES)
      3. EXIT
      4. PRESS KEY TEST
   ■ 5. SCAN CODE RETURN TEST
SELECT MENU : _
```

(Fig.2)

For 4. PRESS KEY TEST. (Fig.2)
Press (4) and (Enter) Keys. Fig.3 displayed.
● Display

```
PRESS KEY TEST
      1. TEST ALL DEVICES      (■DEVICES)
      2. TEST AUTOMATICALLY (■DEVICES)
      3. EXIT
      4. U.S.A.
      5. U.K.
      6. SWEDEN
      7. JAPAN
      8. GERMANY
      9. FRANCE
     10. ITALY
     11. SPAIN
     12. SWISS (Gr)
   SELECT MENU : _
```

(Fig.3)

For 4. U.S.A.. (Fig.3)
Press (4) * and (Enter) keys. *Note: Press appropriate number according to the keyboard layout.

● Display

```
KEYBOARD TEST
      Press each key for character replacement
 ▮▮▮
```

5) BATTERY PACK TEST

Fig. 1 displayed.
Press (8) and (Enter) keys.

● Display

```
BATTERY PACK TEST
Battery Pack : exists.
AC Adaptor : connected (Not connected)
```

(Normal message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Massage].

6) VIDEO TEST

Fig.1 displayed.
Press (9) and (Enter) keys. Fig.4 displayed.

● Display

```
VIDEO
      1. TEST ALL DEVICES      (■DEVICES)
      2. TEST AUTOMATICALLY    (■DEVICES)
      3. EXIT
   ■ 4. VGA COLOR MODE TEST  ┐ •Use these tests to look at the screen
   ■ 5. VGA MONO MODE TEST   │  and verify that the LCD screen is
   ■ 6. S-VGA COLOR MODE TEST┘  displaying properly.

SELECT MENU : _
```

(Fig.4)

For 4. VGA COLOR MODE TEST. (Fig.4)
Press (4) and (Enter) keys. Fig.5 displayed.

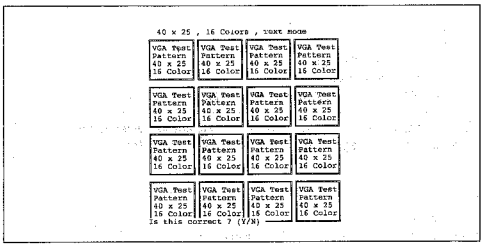
● Display

```
VGA COLOR MODE TEST

      1. TEST ALL DEVICES      (■DEVICES)
      2. TEST AUTOMATICALLY    (■DEVICES)
      3. EXIT
   ■ 4. COLOR 40x25 TEXT MODE TEST
   ■ 5. COLOR 80x25 TEXT MODE TEST
   ■ 6. COLOR 640x200 GRAPHIC MODE TEST
   ■ 7. COLOR 640x350 GRAPHIC MODE TEST
   ■ 8. COLOR 640x480 GRAPHIC MODE TEST
   ■ 9. COLOR 320x200 256 COLOR TEST
   ■10. ASCII CODE PRINT
   ■11. PAGE CHANGE
   ■12. COLOR CHANGE GRAPHICS MODE
   ■13. CIRCLE & SQUARE PRINT

SELECT MENU : _
```

(Fig.5)

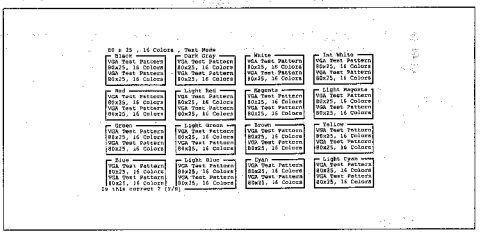
For 4. COLOR 40x25 TEXT MODE TEST. (Fig.5)
Press (4) and (Enter) keys.

- Display



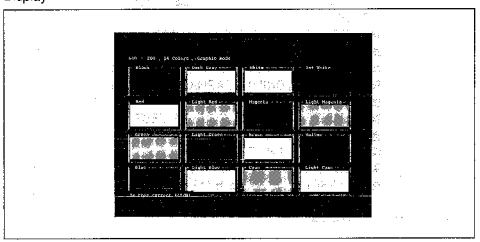
For 5. COLOR 80x25 TEXT MODE TEST. (Fig.5)
Press (5) and (Enter) keys.

- Display



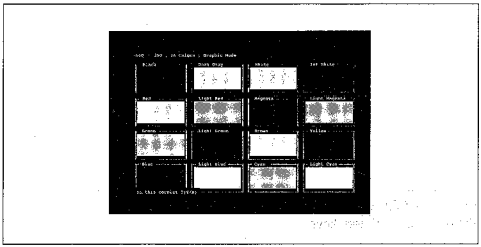
For 6. COLOR 640x200 GRAPHIC MODE TEST. (Fig.5)
Press (6) and (Enter) keys.

- Display



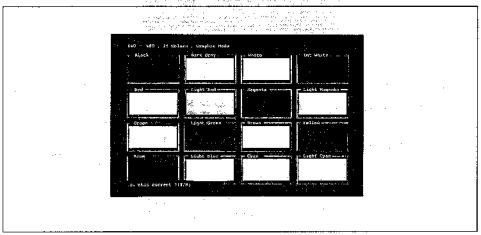
For 7. COLOR 640x350 GRAPHIC MODE TEST. (Fig.5)
Press (7) and (Enter) keys.

- Display



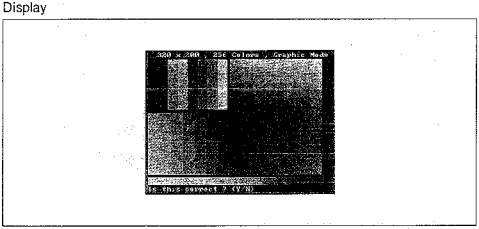
For 8. COLOR 640x480 GRAPHIC MODE TEST. (Fig.5)
Press (8) and (Enter) keys.

- Display



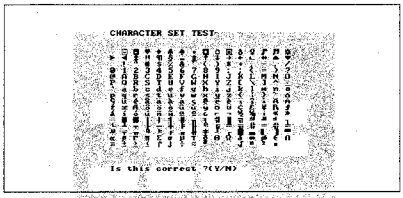
For 9. COLOR 320x200 256 COLOR TEST. (Fig.5)
Press (9) and (Enter) keys.

- Display



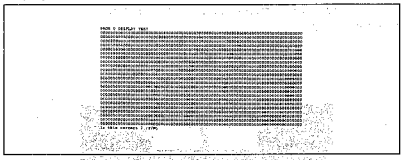
For 10. ASCII CODE PRINT. (Fig.5)
Press (10) and (Enter) keys.

● Display



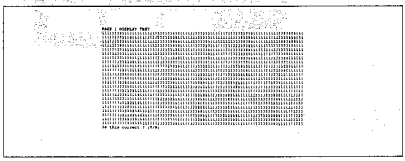
For 11. PAGE CHANGE. (Fig.5)
Press (11) and (Enter) keys.

● Display



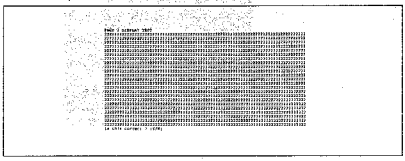
Press (Y) key.

● Display



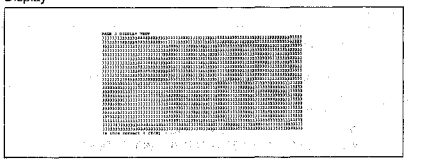
Press (Y) key.

● Display



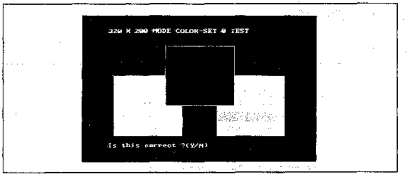
Press (Y) key.

● Display



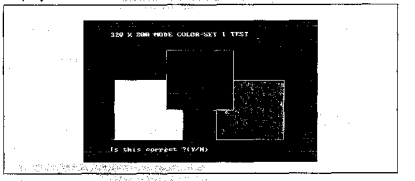
For 12. COLOR CHANGE GRAPHICS MODE. (Fig.5)
Press (12) and (Enter) keys.

● Display



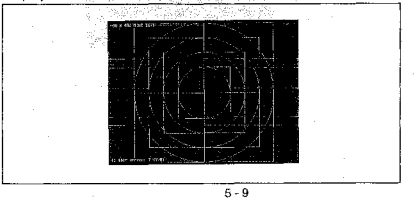
Press (Y) key.

● Display



For 13. CIRCLE & SQUARE PRINT. (Fig.5)
Press (13) and (Enter) keys.

● Display



For 5. VGA MONO MODE TEST. (Fig.4)
Press (5) and (Enter) keys. Fig.6 displayed.

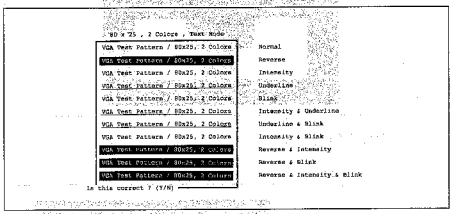
● Display

```
VGA MONO MODE TEST

    1. TEST ALL DEVICES        (■DEVICES)
    2. TEST AUTOMATICALLY      (■DEVICES)
    3. EXIT
  ■ 4. MONO 80 x 25 TEXT MODE TEST
  ■ 5. MONO 640 x 350 GRAPHIC MODE TEST

SELECT MENU : _
```

(Fig. 6)

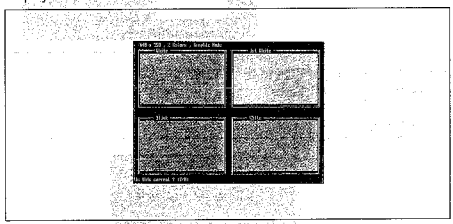
For 4. MONO 80 x 25 TEXT MODE TEST. (Fig.6)
Press (4) and (Enter) keys.

● Display


80 x 25 , 2 Colors , Text Mode
VGA Text Pattern / 80x25, 2 Colors
VGA Text Pattern / 80x25, 2 Colors
VGA Text Pattern / 80x25, 2 Colors
VGA Text Pattern / 80x25, 2 Colors
VGA Text Pattern / 80x25, 2 Colors
VGA Text Pattern / 80x25, 2 Colors
VGA Text Pattern / 80x25, 2 Colors
VGA Text Pattern / 80x25, 2 Colors
VGA Text Pattern / 80x25, 2 Colors
VGA Text Pattern / 80x25, 2 Colors
Normal
Reverse
Intensity
Underline
Blink
Intensity & Underline
Underline & Blink
Intensity & Blink
Reverse & Intensity
Reverse & Blink
Reverse & Intensity & Blink
Is this correct ? (Y/N)

For 5. MONO 640 x 350 GRAPHIC MODE TEST. (Fig.6)
Press (5) and (Enter) keys.

● Display



For 6. S-VGA COLOR MODE TEST. (Fig.4)
Press (6) and (Enter) keys. Fig.7 displayed.

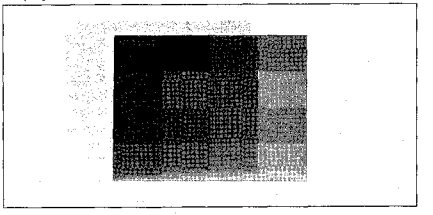
● Display

```
S - VGA COLOR MODE TEST

      1. TEST ALL DEVICES      (■ DEVICES)
      2. TEST AUTOMATICALLY    (■ DEVICES)
      3. EXIT
     ■4. 800 x 600     16 COLOR TEST
     ■5. 640 x 480    256 COLOR TEST
     ■6. 800 x 600    256 COLOR TEST
     ■7. 640 x 480    64K COLOR TEST
     ■8  800 x 600    64K COLOR TEST
     ■9. 640 x 480    16M COLOR TEST
     ■10. 800 x 600   16M COLOR TEST
SELECT MENU : _
```

(Fig.7)

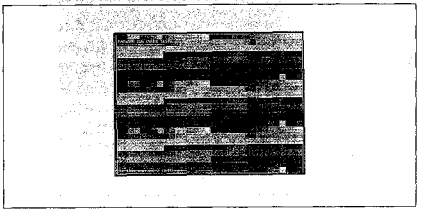
For 4. 800 X 600 16 COLOR TEST. (Fig.7)
Press (4) and (Enter) keys.

● Display



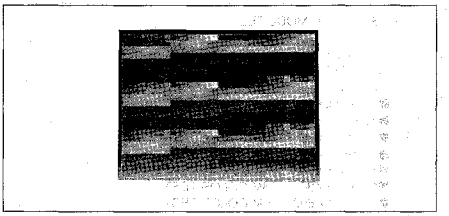
For 5. 640 X 480 256 COLOR TEST. (Fig.7)
Press (5) and (Enter) keys.

● Display



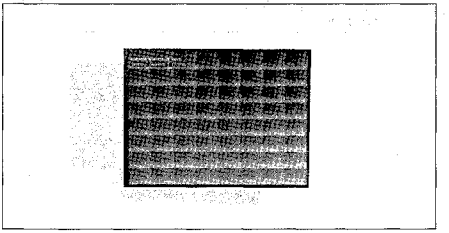
For 6. 800 x 600 256 COLOR TEST. (Fig.7)
Press (6) and (Enter) keys.

● Display



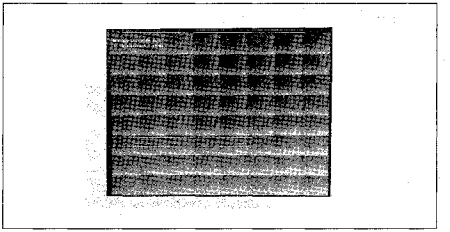
For 7. 640 x 480 64K COLOR TEST. (Fig.7)
Press (7) and (Enter) keys.

● Display



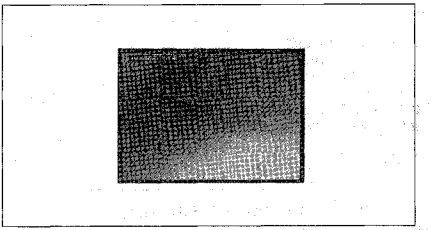
For 8. 800 X 600 64K COLOR TEST. (Fig.7)
Press (8) and (Enter) keys.

● Display



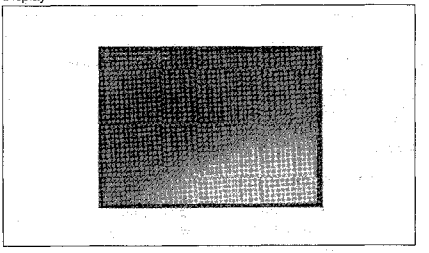
For 9. 640 x 480 16M COLOR TEST. (Fig.7)
Press (9) and (Enter) keys.

● Display



For 10. 800 x 600 16M COLOR TEST. (Fig.7)
Press (10) and (Enter) keys.

● Display



7) 1 HARD DISK DRIVE(S) TEST

Fig.1 displayed.
Press (10) and (Enter) keys. Fig.8 displayed.

● Display

```
1st HARD DISK DRIVE(S)
     1. TEST ALL DEVICES      (■ DEVICES)
     2. TEST AUTOMATICALLY    (■ DEVICES)
     3. EXIT
   ■ 4. HARD DISK CONTROLLER TEST
   ■ 5. 1st HARD DISK DRIVE TEST

   SELECT : _
```

(Fig.8)

For 4. HARD DISK CONTROLLER TEST. (Fig.8)
Press (4) and (Enter) keys.

● Display

```
HARD DISK CONTROLLER TEST
```

(Normal Message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Message].

For 5. 1st HARD DISK DRIVE TEST. (Fig.8)
Press (5) and (Enter) keys. Fig.9 displayed.

● Display

```
1st HARD DISK DRIVE TEST

     1. TEST ALL DEVICES      (■DEVICES)
     2. TEST AUTOMATICALLY    (■ DEVICES)
     3. EXIT
   ■ 4. HDD - DRIVE TEST
     5. HDD - READ/WRITE TEST
   ■ 6. HDD - SEQUENTIAL SEEK TEST
   ■ 7. HDD - RANDOM SEEK TEST

SELECT : _
```

(Fig.9)

For 4. HDD - DRIVE TEST. (Fig.9)
Press (4) and (Enter) keys.

● Display

```
1st HDD - DRIVE TEST
Count value to get SEEK COMPLETE = 0
```

(Normal Message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Message]

For 5. HDD - READ/WRITE TEST. (Fig.9)
Press (5) and (Enter) keys.

● Display

```
1st HDD - READ/WRITE TEST

      xxxxxxxxxxxxxxxxxxxxx Warning !!! xxxxxxxxxxxxxxxxxxxx
            Reserved cylinder for DIAGNOSTICS will lose its data.
            Reserved cylinder number = ***
      xxxxxxxxxxxxxxxxxxxxx Warning !!! xxxxxxxxxxxxxxxxxxxx

Do you want to continue ? (Y/N)
```

Press (Y) key.

(Normal Message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Message].

For 6. HDD - SEQUENTIAL SEEK TEST. (Fig.9)
Press (6) and (Enter) keys.

● Display

```
1st HDD - SEQUENTIAL SEEK TEST

Cylinder = xxx
```

The numbers indicated by xxx will vary depending on the type of HDD.

(Normal Message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Message].

For 7. HDD - RANDOM SEEK TEST. (Fig.9)
Press (7) and (Enter) keys.

● Display

```
1st HDD - RANDOM SEEK TEST

Cylinder = xxx
```

The numbers indicated by xxx will vary depending on the type of HDD.

(Normal Message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Message].

8) 1FLOPPY DISK DRIVE(S) TEST

Fig.1 displayed.
Press (11) and (Enter) keys. Fig.10 displayed.

●Display

```
1st FLOPPY DISK DRIVE(S)
      1. TEST ALL DEVICES      (■ DEVICES)
      2. TEST AUTOMATICALLY    (■ DEVICES)
      3. EXIT
    ■ 4. FLOPPY DISK CONTROLLER TEST
    ■ 5. 1st FLOPPY DISK  DRIVE TEST

   SELECT : _
```

(Fig.10)

For 4. FLOPPY DISK CONTROLLER TEST. (Fig.10)
Press (4) and (Enter) keys.

●Display

```
FLOPPY DISK CONTROLLER TEST
```

(Normal Message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Message].

For 5. 1st FLOPPY DISK DRIVE TEST. (Fig.10)
Press (5) and (Enter) keys. Fig.11 displayed.

●Display

```
1st FLOPPY DISK DRIVE TEST
      1. TEST ALL DEVICES      (■DEVICES)
      2. TEST AUTOMATICALLY    (■ DEVICES)
      3. EXIT
    ■ 4. DRIVE TEST
      5. 720KB - MEDIA TEST
      6. 1.44MB - MEDIA TEST

   SELECT MENU : _
```

(Fig.11)

For 4. DRIVE TEST. (Fig.11)
Press (4) and (Enter) keys.

●Display

```
1st FLOPPY DISK DRIVE (1.44MFD) TEST
```

(Normal Message) : Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Message].

For 5. 720KB - MEDIA TEST. (Fig.11)
Press (5) and (Enter) keys.
NOTE) At this time insert a formattable floppy disk into the FDD.
(All data on the floppy disk will be erased.)

● Display

```
720KB - MEDIA TEST

      xxxxxxxxxxxxxxxxxxxxx Warning ! ! ! xxxxxxxxxxxxxxxxxxxxx
            CONTENTS OF DISK WILL BE DESTROYED
      xxxxxxxxxxxxxxxxxxxxx Warning ! ! ! xxxxxxxxxxxxxxxxxxxxx

      Insert scratch 2DD disk into 1st drive <---------- Press a key to begin formatting.
      Hit any key when ready.

      Formatting.....

      Read/Write test
Sequential seek test
Random seek test
```

(Normal Message): Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Messages].

*Use the same procedure for 6, (1.44MB-MEDIA TEST).

9) 1 PARALLEL PORT(S) TEST.

Fig.1 displayed.
Press (12) and (Enter) keys. Fig.12 displayed.

● Display

```
1st Parallel port test
      1. TEST ALL DEVICES      (■ DEVICES)
      2. TEST AUTOMATICALLY    (■ DEVICES)
      3. EXIT
      4. PRINT OUT TEST
      5. EXTERNAL LOOPBACK TEST
SELECT : _
```

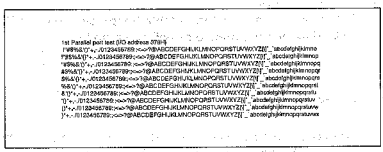
(Fig.12)

For 4. PRINT OUT TEST. (Fig.12)
Press (4) and (Enter) keys.

● Display

```
1st Parallel port test (I/O address xxxH)
Connect printer
Hit any key when ready._
```

(Normal Message): Sample characters will be printed to the printer.



When an error message is displayed, refer to [5.2 Error Message].

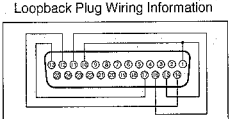
For 5. EXTERNAL LOOPBACK TEST.
Press (5) and (Enter) keys.

- Display

```
1st Parallel port test (I/O address xxxH)

Connect loopback plug. <------ Connect the loopback plug
                               to the parallel port.
Hit any key when ready._
```

(Normal Message): Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Message].

Loopback Plug Wiring Information



1-10-15 Pin
11-16 Pin
12-14 Pin
13-17 Pin

10) 1 SERIAL PORT(S)

Fig.1 displayed.
Press (13) and (Enter) keys. Fig.13 displayed.

- Display

```
1st SERIAL PORT TEST

    1. TEST ALL DEVICES      (■ DEVICES)
    2. TEST AUTOMATICALLY    (■ DEVICES)
    3. EXIT
  ■ 4. RS232C CONTROLLER REGISTER R/W TEST
  ■ 5. INTERNAL LOOPBACK TEST
    6. EXTERNAL LOOPBACK TEST

SELECT MENU : _
```

(Fig.13)

For 4. RS232C CONTROLLER REGISTER R/W TEST. (Fig.13)
Press (4) and (Enter) keys.

● Display

```
1st serial port test (I/O address xxxH)
```

(Normal Message): Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Message].

For 5. INTERNAL LOOPBACK TEST. (Fig.13)
Press (5) and (Enter) keys.

● Display

```
1st serial port test (I/O address xxxH)
```

(Normal Message): Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Message].

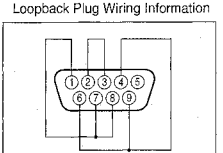
For 6. EXTERNAL LOOPBACK TEST. (Fig.13)
Press (6) and (Enter) keys.

● Display

```
1st serial port test (I/O address xxxH)

Connect loopback plug. <------- Connect the loopback plug
                                to the serial port.
Hit any key when ready._
```

(Normal Message): Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Message].

Loopback Plug Wiring Information



11) SOUND TEST

Fig.1 displayed.
Press (14) and (Enter) keys. Fig.14 displayed.

● Display

```
SOUND
      1. TEST ALL DEVICES     (■ DEVICES)
      2. TEST AUTOMATICALLY   (■ DEVICES)
      3. EXIT
    ■ 4. FM PLAY TEST
    ■ 5. SOUND REGISTER TEST
SELECT MENU : _
```

(Fig.14)

For 4. FM PLAY TEST. (Fig.14)
Press (4) and (Enter) keys.

● Display

```
FM PLAY TEST
    Playing
```

Make sure the sound is coming up.

(Normal Message): Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Message].

For 5. SOUND REGISTER TEST. (Fig.14)
Press (5) and (Enter) keys.

● Display

```
SOUND REGISTER TEST
SOUND REGISTER (22xH) R/W OK.
```

(Normal Message): Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Message].

12) PCCARD CONTROLLER TEST.

Fig.1 displayed.
Press (15) and (Enter) keys.

● Display

```
PCCARD CONTROLLER
```

(Normal Message): Test done ! ! Hit any key when ready._
when an error message is displayed, refer to [5.2 Error Message].

13) INFRARED COMMUNICATION PORT TEST.

Fig.1 displayed.
Press (16) and (Enter) keys. Fig.15 displayed.

● Display

```
1. TEST ALL DEVICES      (■ DEVICES)
2. TEST AUTOMATICALLY    (■ DEVICES)
3. EXIT
■ 4. CONTROLLER REGISTER R/W TEST
■ 5. INTERNAL LOOPBACK TEST
SELECT MENU : _
```

(Fig.15)

For 4. CONTROLLER REGISTER R/W TEST. (Fig.15)
Press (4) and (Enter) keys.

● Display

```
CONTROLLER REGISTER R/W TEST
Infrared port (I/O address xxxxH)
```

(Normal Message): Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Message].

For 5. INTERNAL LOOPBACK TEST. (Fig.15)
Press (5) and (Enter) keys.

● Display

```
INTERNAL LOOPBACK TEST
Infrared port (I/O address xxxxH)
```

(Normal Message): Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Message].

14)CD-ROM DRIVE TEST.

Fig.1 desplayed.
Press (17) and (Enter) keys

Insert the Firstaid CD in to the CD-ROM drive.

● Display

```
Place the enclosed Firstaid CD on the CD-ROM drive.
Hit any key when ready_
```

(Normal Message): Test done ! ! Hit any key when ready._
When an error message is displayed, refer to [5.2 Error Message].

5.2 Error Message

Test Item		Error Message	Source of Problem	Component	Ref.Page Schematic Diagram
Main PCB Test					
CMOS RAM shutdown byte r/w test	CRAM	Shutdown byte test failed. (F10) Write data: xxxx Read data: xxxx	Main PCB	IC11	Main 9, 10
Programmable interrupt timer test	PIT	Timer #2 counter r/w failed. (F10) Write data: xx Read: xx	Main PCB	IC11	Main 9, 10
	PIT	Timer count failed. (F10) High count value expected: 00 current data: xx			
Page register r/w test	PREG	Page register r/w test failed. (byte) (F10) Write data = xx Read data = xx	Main PCB	IC11	Main 9, 10
	PREG	Page register r/w test failed. (word) (F10) Write data = xx Read data = xx			
DMA controller register r/w test	DMAC	DMA controller register r/w test failed. (F10) I/O address: xxxx Write data: xxxx Read data: xxxx	Main PCB	IC11	Main 9, 10
Keyboard controller test	KBCTRL	Keyboard controller input buffer full. (F10)	Main PCB	IC23	Main 18
	KBCTRL	Keyboard line always low. (clock) (F10)			
	KBCTRL	Keyboard line always high. (clock) (F10)			
	KBCTRL	Keyboard line always low. (data) (F10)			
	KBCTRL	Keyboard line always high. (data) (F10)			
	KBCTRL	Keyboard controller output buffer empty. (F10)			
	KBCTRL	Keyboard controller self test failed. (F10) Return code: xx			
Programmable interrupt controller test	PIC	PIC #0 interrupt mask register failed. (F10) Write data: xx Read data: xx	Main PCB	IC11	Main 9, 10
	PIC	PIC #1 interrupt mask register failed. (F10) Write data: xx Read data: xx			
	PIC	PIC #0 handling error (F10) ISR status: xx			
	PIC	PIC #1 handling error (F10) ISR status: xx			
	PIC	PIC #0 no interrupt occurred. (F10)			
	PIC	PIC #1 no interrupt occurred. (F10)			
Real-time clock test	RTC	Real-time clock UIP bit always ON. (F10)	Main PCB	IC11	Main 9, 10
	RTC	Real-time clock UIP bit always OFF. (F10)			
	RTC	Real-time clock data out of range. (F10) (Second data: ss) (Minute data: mm) (Hour data: hh) (Data data: dd) (Month data: mm) (Year data: yyyy)			
RAM Test					
DRAM r/w test	DRAM	DRAM R/W test failed. (F11) Address: xxxxxxxxH Write data: xxH Read data: xxH	Main PCB	IC7-10	Main 7
DRAM refresh test	DRAM	DRAM Refresh test failed. (F11) Address: xxxxxxxxH Write data: xxH Read data: xxH	Main PCB	IC7-10	Main 7
DRAM address line test	DRAM	DRAM Address Line test failed. (F11) The data written into address: xxxxxxxxH can be read from address: yyyyyyyyH	Main PCB	IC7-10	Main 7
Protect test		[xx] Protected mode error. (F11)	Main PCB	CPU IC5	—— Main 4, 5

Test Item	Error Message	Source of Problem	Component	Ref.Page Schematic Diagram
Keyboard Test				
Keyboard reset test	KEY Keyboard failed. (F40)	Main PCB	IC11 IC23	Main 9, 10 Main 18
Keyboard data test	KEY Keyboard has been hit or broken. (F10) SCAN code : xx	Main PCB	IC23	Main 18
Floppy Disk Drive Test				
Floppy disk controller test	FDC failed. (F10) Master status: n1n2 Floppy Disk Controller (FDC) master status has failed. Data bus or FDC chip has failed. (n1n2 is FDC master status listed on page 5-26.)	Main PCB	IC19	Main 16
Floppy disk controller test	Init. failed. (F10) BIOS status : xx Floppy Disk Controller (FDC) initialization has failed. Data bus or FDC chips have failed. (xx is BIOS disk error status listed on page 5-26.)	Main PCB	IC19	Main 16
Floppy disk drive test	Seek failed (max. track) (F30) Seek has failed. Floppy Disk Controller (FDC) cable or FDC chip has failed.	FDD	———	———
Floppy disk drive test	Seek failed (0 track) (F30) Seek has failed. Floppy Disk Controller (FDC) cable or FDC chip has failed.	FDD	———	———
Floppy disk controller test	Cannot change spindle speed of FDD motor (F10)	Main PCB	IC19	Main 16
Hard Disk Drive Test				
HDC reset test	HDC reset failed. (F31)	HDD	———	———
HDC diagnostic test	HDC internal diagnostic failed. (F31)	HDD	———	———
HDD set parameter test	HDD set drive parameter failed. (F31) BIOS status: xx HDC status: xx HDC error status: xx (xx: Refer to page 5-26.)	HDD	———	———
HDD drive ready test	HDD drive not ready. (F31) BIOS status: xx HDC status: xx HDC error status: xx (xx: Refer to page 5-26.)	HDD	———	———
HDD recalibrate test	HDD recalibrate failed. (F31) BIOS status: xx HDC status: xx HDC error status: xx (xx: Refer to page 5-26.)	HDD	———	———
HDD seek test	HDD seek failed. (F31) BIOS status: xx HDC status: xx HDC error status: xx (xx: Refer to page 5-26.)	HDD	———	———
HDD seek time test	HDD seek does not complete within some period. (F31) BIOS status: xx HDC status: xx HDC error status: xx (xx: Refer to page 5-26.)	HDD	———	———

Test Item	Error Message	Source of Problem	Component	Ref.Page Shematic Diagram
Serial Port Test				
Register test	RS232 Serial port failed. (F71) Interrupt ID Write: xx Read: xx RS232 Serial port failed. (F71) Divisor Write: xx Read: xx	Main PCB	IC19	Main 16
Internal loopback test	RS232 Serial port data loopback failed. (F71) Line & modem status: n1n2,n3n4 (Refer to the tables of loopback line status and loopback modem status on page 5-26.) RS232 Serial port data loopback failed. (F71) Xmit: xx Recv: xx RS232 Serial port signal loopback failed. (F71) Modem status: n3n4 Expected: n3'n4' (n3n4: result by test. Refer to the table of loopback modem status on page 5-26. n3'n4': expected status.)	Main PCB	IC19	Main 16
External loopback test	RS232 Serial port signal real loopback test failed. (F71) Modem status: n3n4 Expected: n3'n4' (n3n4: result by test. Refer to the table of loopback modem status on page 5-26. n3'n4': expected status.) RS232 Serial port data real loopback test failed. (F71) Line status : n1n2 (n1n2: Refer to the table of loopback line status on page 5-26.) RS232 Serial port data real loopback test failed. (F71) Xmit: xx Recv: xx RS232 Data real loopback transmit failed. (F71) Line status: n1n2 (n1n2: Refer to the table of loopback line status on page 5-26.) RS232 Data real loopback interrupt request failed. (F71) Line status: n1n2 (n1n2: Refer to the table of loopback line status on page 5-26.) RS232 Data real loopback receive failed. (F71) Line status: n1n2 (n1n2: Refer to the table of loopback line status on page 5-26.)	Main PCB	IC19 IC22	Main 16 Main 17
Parallel Port Test				
Printer Out Test	PPA Time -out error occurred with parallel printer. (F72) BIOS status: n1n2 Character: xx PPA I/O error occurred with parallel printer. (F72) BIOS status: n1n2 Character: xx (n1n2 is a printer BIOS error status listed on page 5-27.)	Main PCB	IC19	Main16
	PPA Paper end occurred with parallel printer. (F72) BIOS status: n1n2 Character: xx (xx is the character sent to the printer.)	Paper end	———	———
External Loopback test	PPA Parallel port interrupt request failed. (F72) PPA Parallel port signal real loopback test failed. (F72) Status: xx Expected: xx	Main PCB	IC19	Main 16

Test Item	Error Message	Source of Problem	Component	Ref.Page (Shematic Diagram)
Infrared Communication Port Test				
Controller register r/w test	Infrared port failed. (F80)	Main PCB	IC19	Main 16
PC CARD Controller Test				
	PC CARD Controller is invalid. (F10) Controller status : xxH	Main PCB	IC17	Main 14
Sound Test				
Sound register test	SOUND REGISTER R/W ERROR! ! (F81) SB DSP RESET ERROR (F81) MPU RESET ERROR (F81)	Main PCB	IC24	Main 19
Battery Test				
	Battery Overcharged (F10) Battery Overdischarged (F10) Battery Cell balance error (F10) Battery Switching error (F10) Battery Temperature is out of range (F10) Battery Exceed maximum charging amount (F10) Battery Exceed maximum charging time (F10) Battery Serial communication error (F10) Battery Charging current does not decrease (F10) Battery No response from battery (F10) Battery Charging current error (F10) Battery Abnormal high voltage (F10) Battery Abnormal temperature (F10) Battery Low voltage after 60 minutes charged (F10) Battery No battery but voltage is deleted (F10) Battery Exceed maximum charging amount (F10) Battery Abnormal charging current (F10) Battery Abnomal CPU temperature (F10)	Main PCB	IC42	Main 26
CD-ROM Test				
	No CD-ROM drive found. (F32) Invalid CD-ROM or no CD-ROM. (F32)	Main PCB	IC11	Main 9, 10

• FDC master status

Nibble	Bit	Meaning
n1	D3	1: FDC data register is ready to receive and transmit data
	D2	1: Transmit data from FDC to processor
	D1	1: Transmit in non-DMA mode
	D0	1: FDC is busy
n2	D3	
	D2	
	D1	1: Seek in drive B
	D0	1: Seek in drive A

• BIOS disk error status

Status	Meaning
80	Time out
40	Seek out
20	FDC failed
10	CRC error
0C	Bad media type
09	DMA boundary
08	DMA overrun
06	Diskette removed
04	Sector not found
03	Write protected
02	No address mark
01	Invalid command

• BIOS error status

Status	Meaning
FF	Sense status failed
E0	Error status register
CC	Write fault
BB	Undefined error
AA	Drive not ready
80	Time out
40	Seek error
20	Controller failed
11	ECC corrected data error
10	Bad CRC or ECC
0F	DMA arbitration level out of range
0E	Control data address mark detected
0D	Invalid number of sectors on format
0B	Bad cylinder
0A	Bad sector
09	DMA boundary
08	DMA overrun
07	Drive parameter error
05	Reset failed
04	Sector not found
02	No address mark
01	Invalid command

• HDC error status

Nibble	Bit	Meaning
n3	D3	1: Back block
	D2	1: Non-correctable ECC error
	D1	1:
	D0	1: Selector not found
n4	D3	1:
	D2	1: HD not ready
	D1	1: No track 00 signal
	D0	1: No address mark

• HDC status

Nibble	Bit	Meaning
n1	D3	1: HDC is busy
	D2	1: HDC is ready
	D1	1: Write fault signal from HD
	D0	1: Seek is completed
n2	D3	1: HDC requests to transmit data
	D2	1: ECC corrected data
	D1	1: Index pulse signal
	D0	1: Error found in executed instructions

• Loopback line status

Nibble	Bit	Meaning
n1	D3	1: Timing out
	D2	1: Transmit shift register (is) empty
	D1	1: Transmit-holding register (is) empty
	D0	1: Break detect
n2	D3	1: Framing error
	D2	1: Parity error
	D1	1: Overrun error
	D0	1: Data ready

• Loopback modem status

Nibble	Bit	Meaning
n3	D3	1: Carrier detect (CD)
	D2	1: Ring indicator (RING)
	D1	1: Data set ready (DSR)
	D0	1: Clear to send (CTS)
n4	D3	
	D2	
	D1	
	D0	

• Printer BIOS error status

Nibble	Bit	Meaning
n1	D3	0: Busy
	D2	1: Acknowledge
	D1	1: Paper end
	D0	1: Printer is selected
n2	D3	1: I/O error
	D0	1: Time-out

- When an error occurs during format, verify, write and read tests for FDD, an error message is displayed in the following format of the command and error names:

(Format of Error Message)

[Command Name] failed: [Error Name] Cylinder = xx Head = xx Sector = xx

Command Name: Read
Write
Verify
Format
Read long
Write long
Command

Error Name: HDC not found (FFH)
Bad err register (E0H)
Write fault (CCH)
Undefined error (BBH)
Drive not ready (AAH)
Time-out (80H)
Seek error (40H)
FDC or HDC error (20H)
Data corrected (11H)
CRC or ECC error (10H)
Bad track (0BH)
Bad sector mark (0AH)
64 K boundary (09H)
DMA overrun (08H)
Parameter error (07H)
Reset error (05H)
No record (04H)
Write protected (03H)
No address mark (02H)
Invalid command (01H)

When there is a difference between write data and read data, the following error message is displayed:

Compare error Cylinder = xx Head = xx Sector = xx

- When an error occurs during format, write long, read long, write and read tests for HDD, an error message is displayed in the following format of command and error names:

(Format of Error Message)

[Command Name] failed: [Error Name] Cylinder = xx Head = xx Sector = xx

Command Name: Please refer to the FDD section above.
Error Name: Please refer to the FDD section above.

6. Disassembly/Reassembly

Note: Power off the computer. Do not shut down to the Suspend or Hibernation mode.

Do not add peripherals while the computer is in the Suspend or Hibernation mode; abnormal operation may result.

6.1 Removing the Battery Pack.

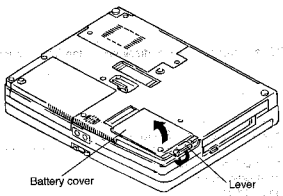


Figure 1

1. Release the lever on the back of the main unit and open the battery cover.

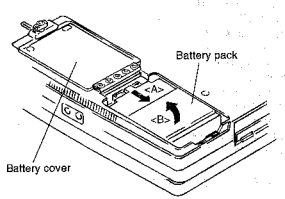


Figure 2

2. Slide the battery in the direction of arrow <A>, Lift in the direction of arrow <B> and remove.

6.2 Removing the HDD and RAM Card.

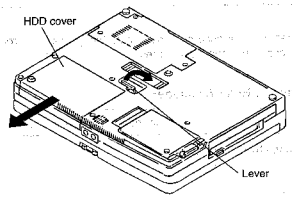


Figure 3

1. Release the lever on the back of the main unit and remove the HDD cover.

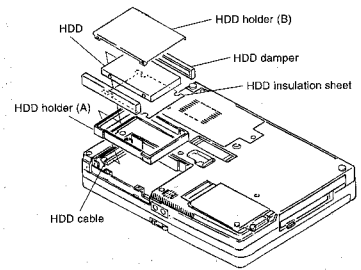


Figure 4

2. Lift the HDD unit.
   Disconnect the HDD cable.
3. Remove the HDD holders (A),(B), HDD dampers and HDD insulation sheet.

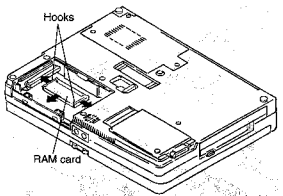


Figure 5

4. While opening the hooks on the RAM card connector outward, lift and remove the RAM card.

6.3 Removing the CPU and CPU FAN.

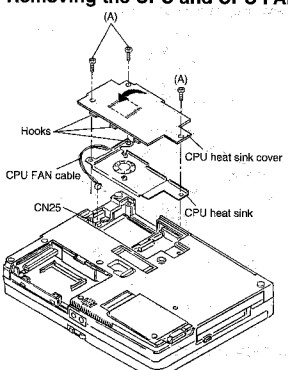


Figure 6

1. Remove the three screws (A).
2. Remove the CPU heat sink cover in the direction of arrow.
3. Disconnect the CPU FAN cable.
4. Remove the CPU heat sink.

Screw (A): XSB26+25FZ

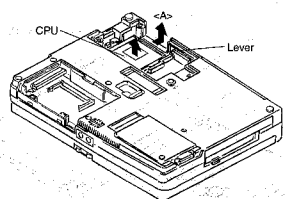


Figure 7

5. Lift the CPU socket lever in the direction of arrow <A> to re- lease and remove the CPU.

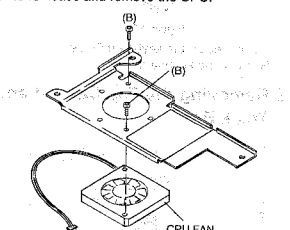


Figure 8

6. Remove the two screws (B). Remove the CPU FAN.

Screw (B): XYN25+J8

6.4 Removing the Keyboard.

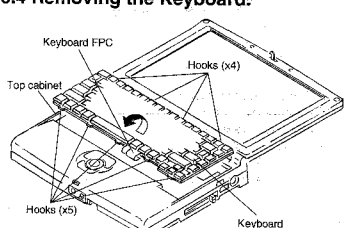


Figure 9

1. Release the hooks with a flathead screwdriver and tilt the keyboard in the direction of arrow.

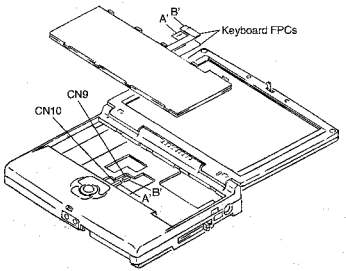


Figure 10

2. Disconnected the keyboard FPCs.
   Remove the keyboard.

6.5 Removing the Top Cabinet and Track Ball.

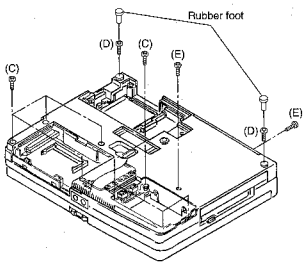


Figure 11

1. Remove the two rubber foots.
2. Remove the eight screws (C), two screws (D) and Two screws (E).

Screw (C): XTB26+10GFZ
(D): XTB26+16GFZ
(E): XSB26+5FZ

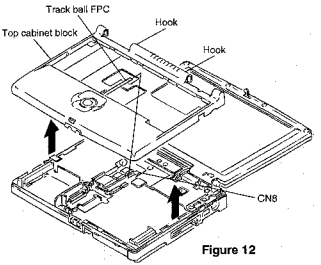


Figure 12

3. Remove the top cabinet block in the direction of arrow.
4. Disconnect the track ball FPC.

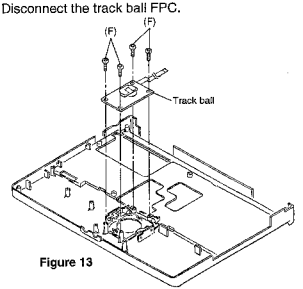


Figure 13

5. Remove the four screws (F) and Track ball.
   Screw (F): XYN2+J6

6.6 Removing the Display.

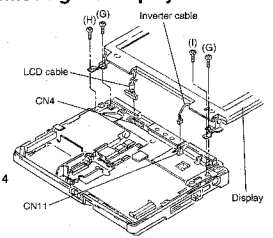


Figure 14

1. Remove the two screws (G), screw(H) and screw (I).
2. Disconnect the LCD cable and Inverter cable.
3. Remove the display.

Screw (G): XYN26+J6FN (H): XYN26+C10
(I): XYN26+C6FZ

6.7 Removing the FDD.

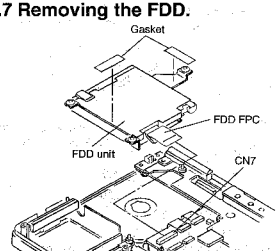


Figure 15

1. Disconnect the FDD FPC.
2. Release the gaskets and remove the FDD unit.

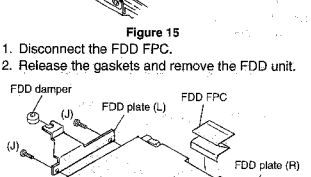


Figure 16

3. Disconnect the FDD FPC.
4. Remove the four screws (J) and FDD plates (L), (R).

Screw (J): XYN2+J4FN

6.8 Removing the LED PCB.

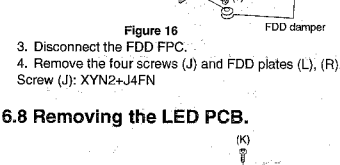


Figure 17

1. Remove the screw (K) and LED PCB.

Screw (K): XSB26+4FN

6.9 Removing the Main PCB and FAN (Sub).

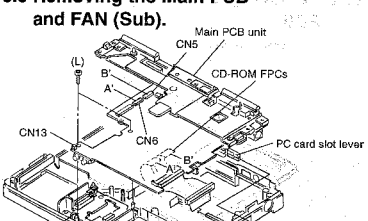


Figure 18

1. Disconnect the CD-ROM FPCs and speaker cable.
2. Remove the two screws (L).
3. Remove the main PCB unit

Screw (L): XTB26+8GFZ

Caution: Because the PC card slot lever projects beyond the main unit, use caution when removing.

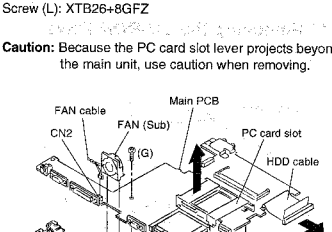


Figure 19

4. Remove the six screws (M), screw (N) and screw (G). Disconnect the FAN (Sub) cable. Remove the CPU heat sink (top).
5. Remove the two screws (O). Remove the FAN (Sub).
6. Disconnect the HDD cable.
7. Remove the four screws (J). Disconnect the PC card slot.

Screw (G): XYN26+J6FN
(J): XYN2+J4FN
(M): DFHE5083ZA
(N): XSB2+4FN
(O): XYN25+C9

6.10 Removing the Battery Connector PCB.

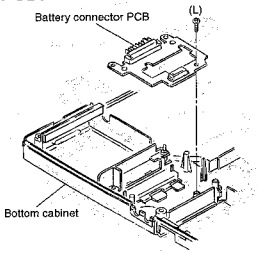


Figure 20

1. Remove the screw (L).
   Remove the battery connector PCB.

Screw (L): XTB26+8GFZ

6.11 Removing the CD-ROM Drive.

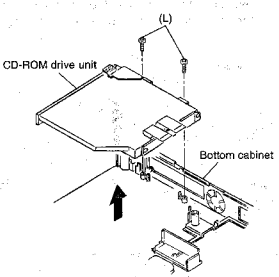


Figure 21

1. Remove the screws (L).
   Remove the CD-ROM drive unit.

Screw (L): XTB26+8GFZ

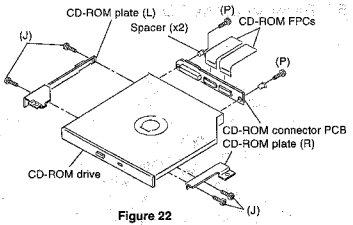


Figure 22

2. Disconnect the CD-ROM FPCs.
   Remove the two screws (P) and two spacers.
   Remove the CR-ROM connector PCB.
3. Remove the four screws (J) and CD-ROM plates (L), (R).

Screw (J): XYN2+J4FN
(P): XYN2+J8

6.12 Removing the Bottom Cabinet.

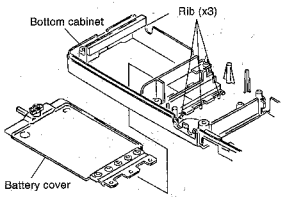


Figure 23

1. Remove the battery cover from the ribs.

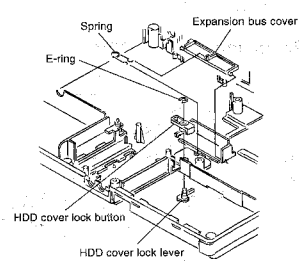


Figure 24

2. Remove the spring and expansion bus cover.
3. Remove the E-ring, HDD cover lock button and HDD cover lock lever.

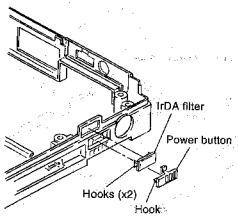


Figure 25

4. Remove the IrDA filter and power button.

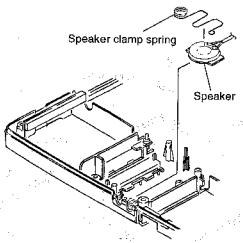


Figure 26

5. Remove the speaker clamp spring.
   Remove the speaker.

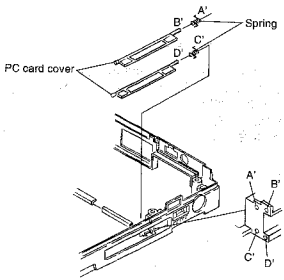


Figure 27

6. Remove the two springs and two PC card cover.

6.13 Removing the LCD Unit and Inverter PCB.

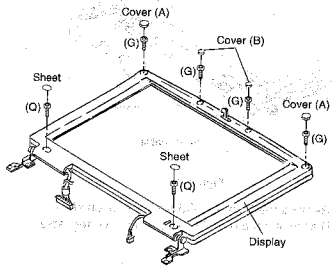


Figure 28

1. Remove the two covers (A), two covers (B) and two sheets.
   Remove the four screws (G) and two screws (Q).
   Screw (G): XYN26+J6FN
   (Q): XYN26+J7

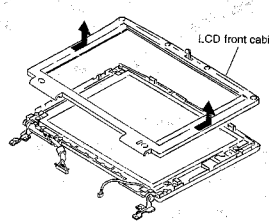


Figure 29

2. Remove the LCD front cabinet in the direction of arrow.

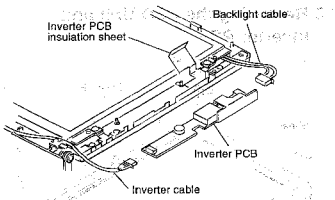


Figure 30

3. Remove the Inverter PCB from insulation sheet.
4. Disconnect the backlight cable and inverter cable.

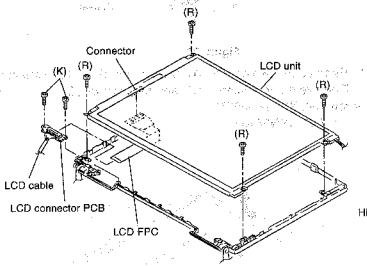


Figure 31

5. Remove the four screws (R) and two screws (K).
6. Lift the LCD unit.
   Disconnect the LCD FPC and LCD cable.
7. Remove the LCD unit.

Screw (K): XSB26+4FN
(R): XSB3+5FN

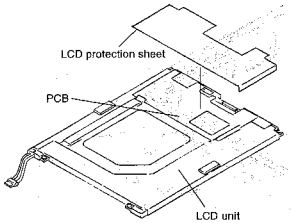


Figure 32

8. Remove the LCD protection sheet.

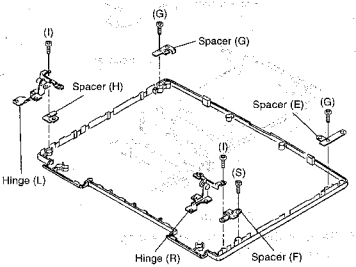


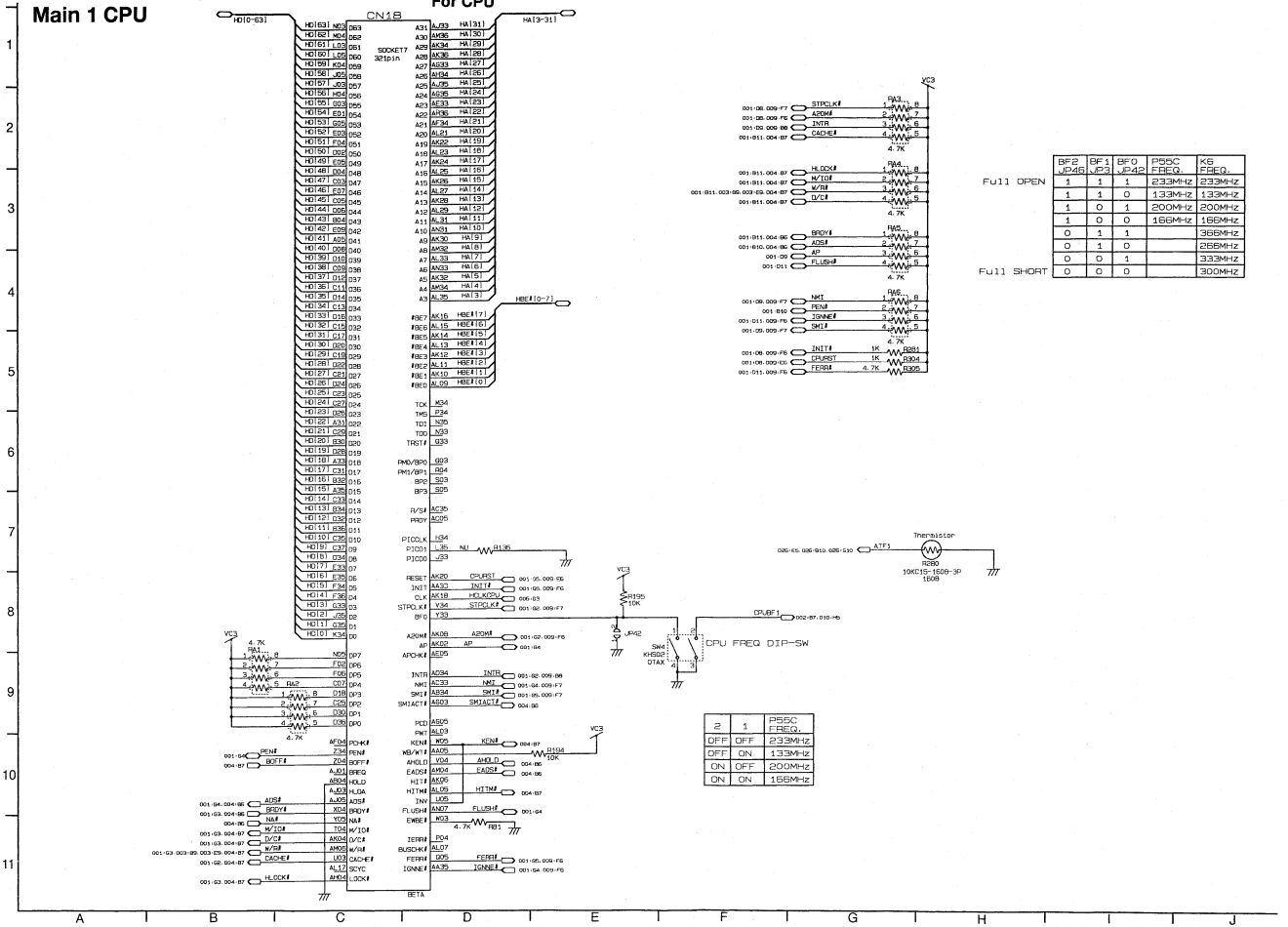
Figure 33

9. Remove the two screws (I), two screws (G) and screw (S).
   Remove the hinge (L), (R) and spacers (E), (F), (G), (H).

Screw (G): XYN26+J6FN
(I): XYN26+C6FZ
(S): XYN26+C4

7. Schematic Diagrams

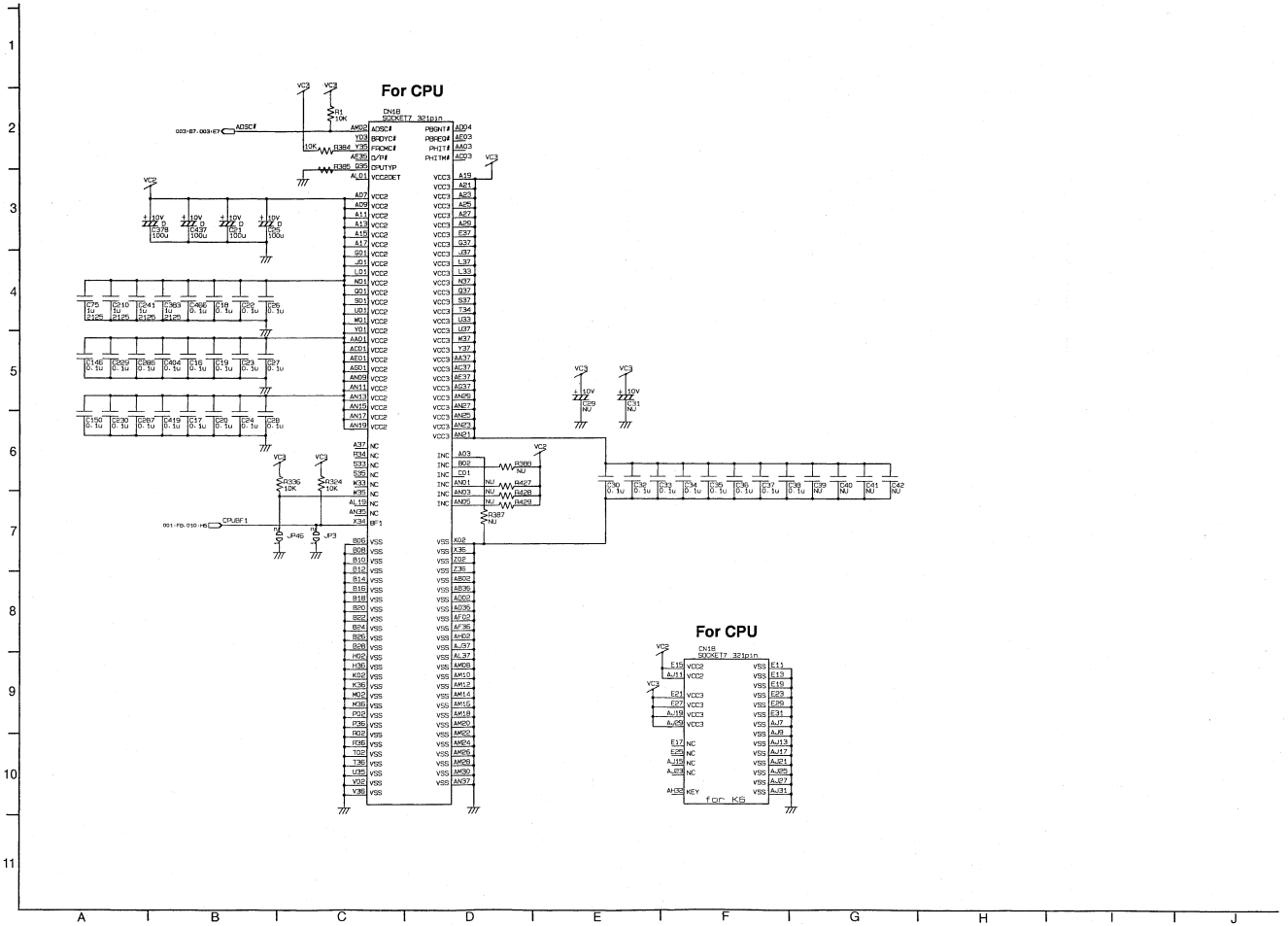
Main 1 CPU



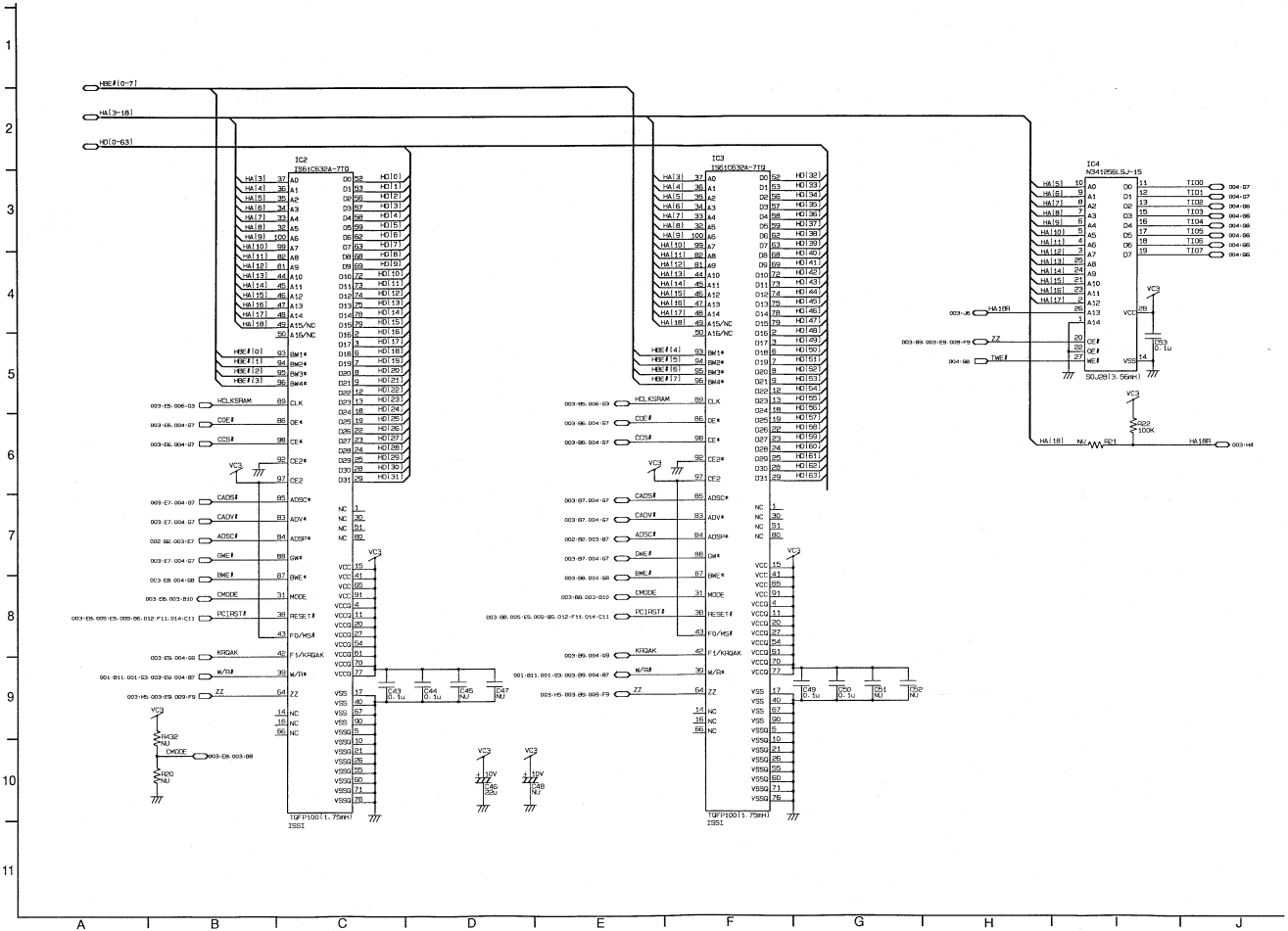
BF2 JP46	BF1 JP43	BF0 JP42	P55C FREQ.	K6 FREQ.
Full OPEN	1	1	1	233MHz	233MHz
	1	1	0	133MHz	133MHz
	1	0	1	200MHz	200MHz
	1	0	0	166MHz	166MHz
	0	1	1		366MHz
	0	1	0		266MHz
	0	0	1		333MHz
Full SHORT	0	0	0		300MHz

2	1	P55C FREQ.
OFF	OFF	233MHz
OFF	ON	133MHz
ON	OFF	200MHz
ON	ON	166MHz

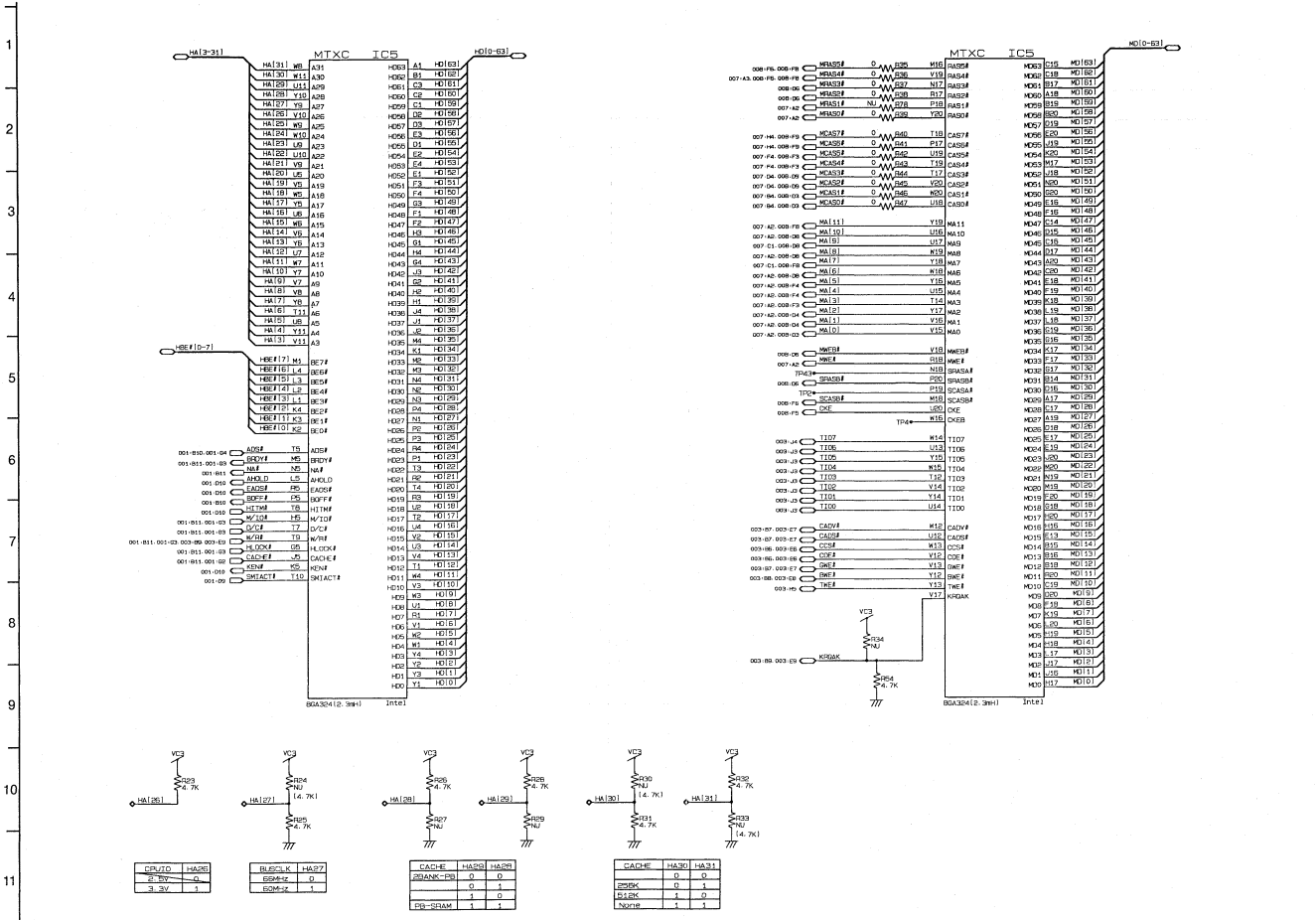
Mian 2 CPU



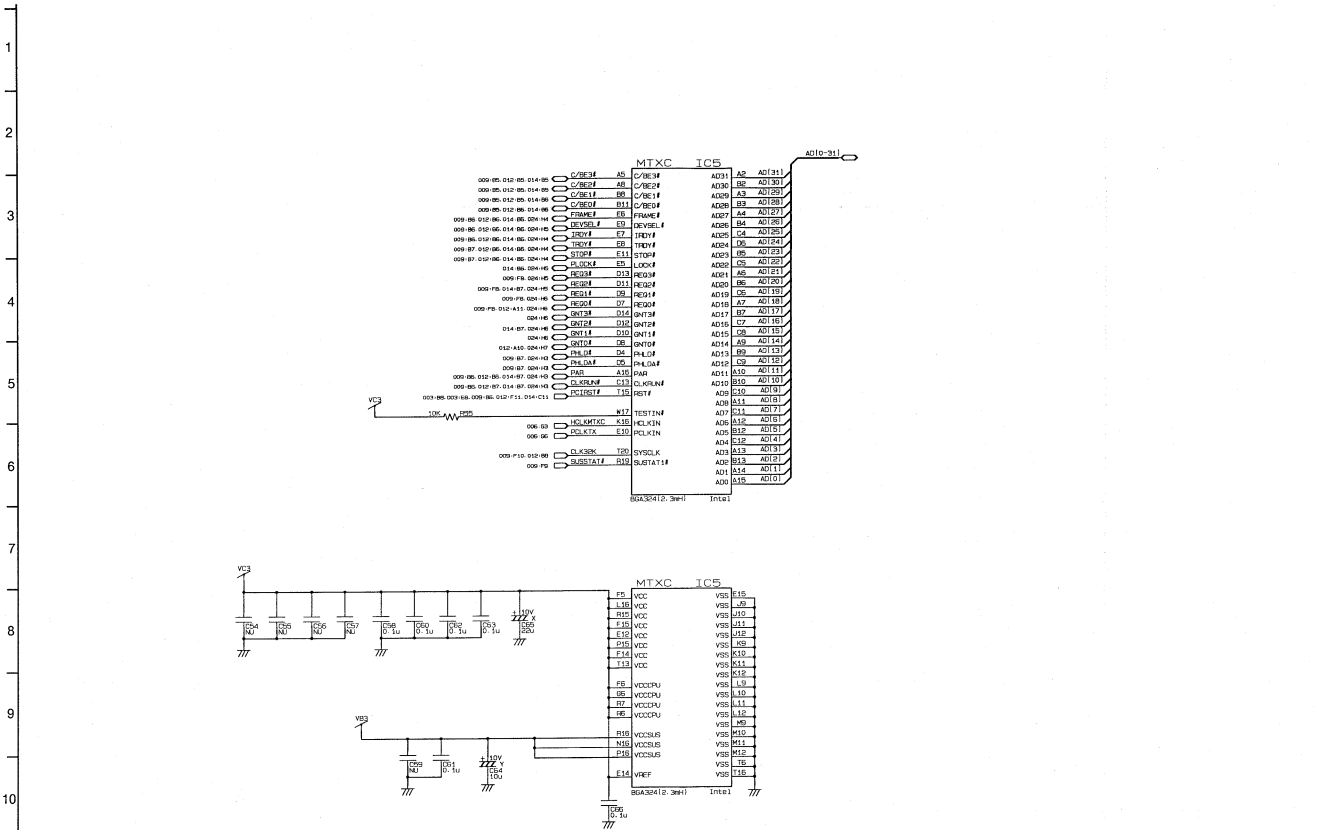
Main 3 L2 Cache



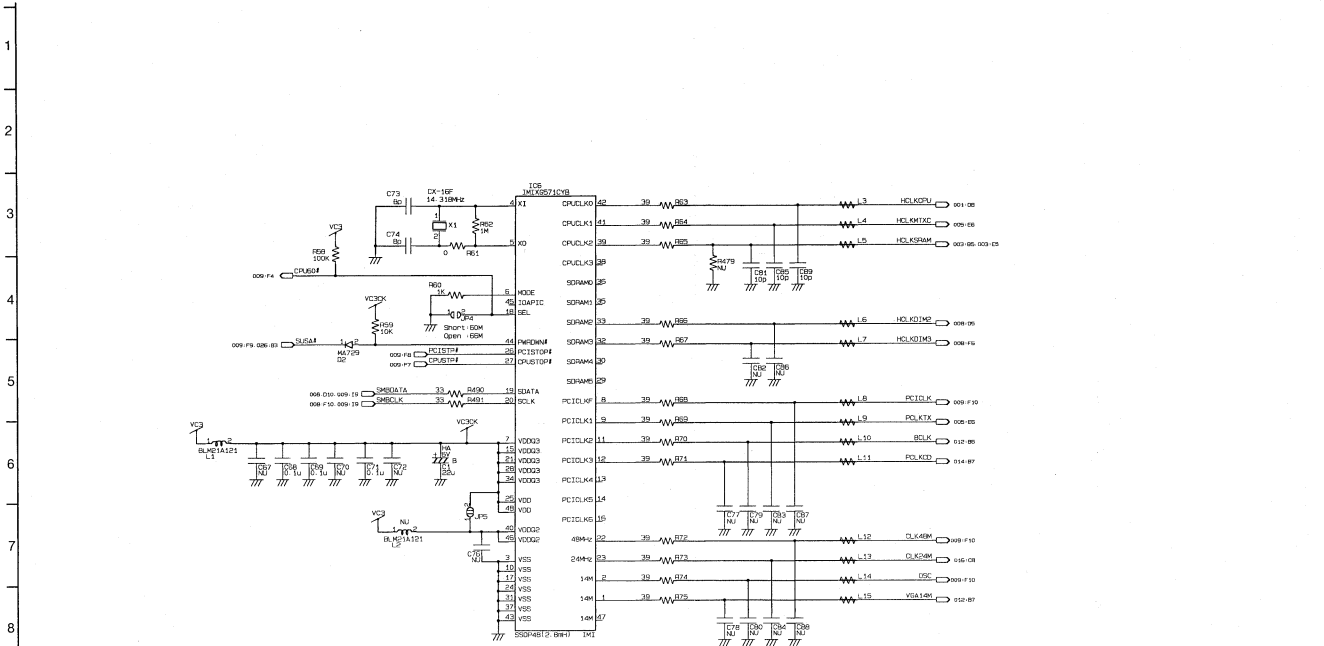
Main 4 MTXC


MTXC IC5
HA[3-31]
HD[0-63]
HBE#[0-7]
BGA324(2.3mm)
Intel
MTXC IC5
MD[0-63]
BGA324(2.3mm)
Intel
CPUTO HA26
2.5V 0
3.3V 1
BUSCLK HA27
66MHz 0
60MHz 1
CACHE HA28 HA29
256K 0 0
512K 0 1
1M 1 0
PB-SRAM 1 1
CACHE HA30 HA31
256K 0 0
512K 1 0
None 1 1

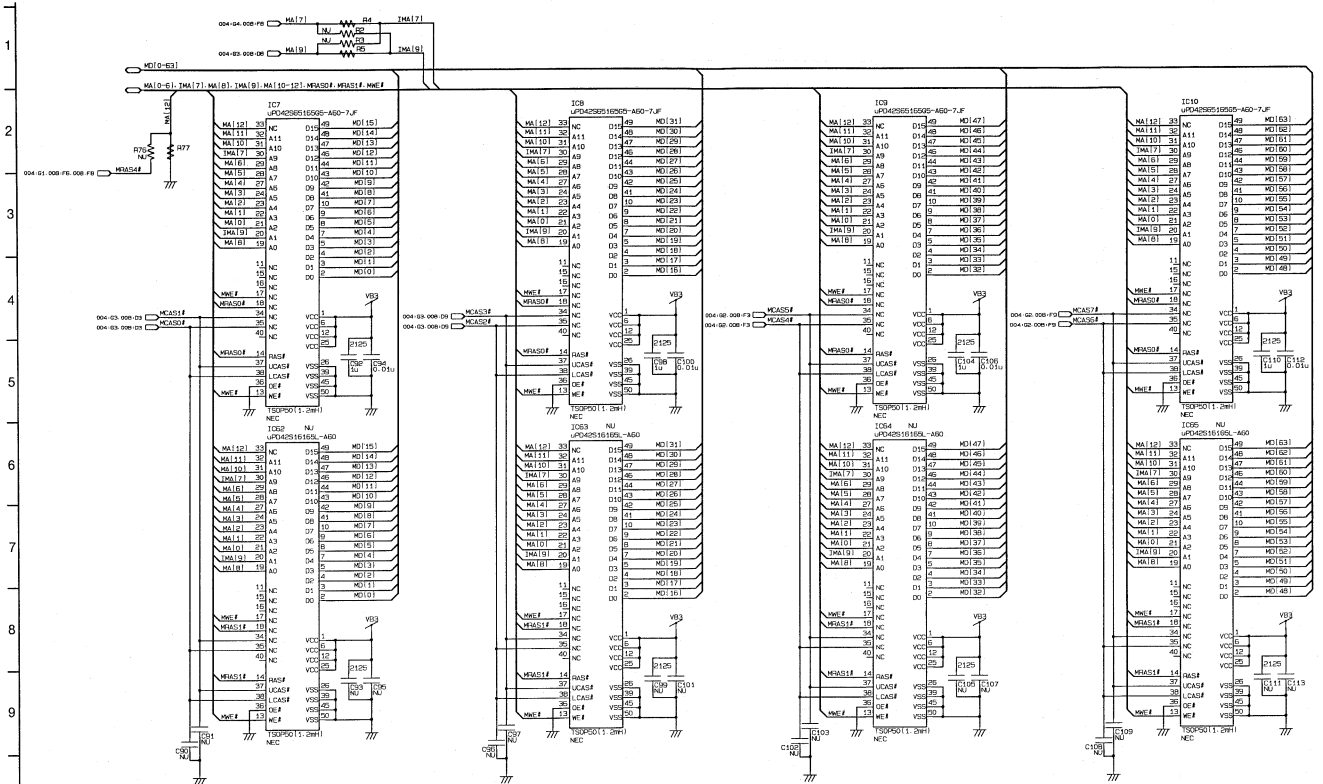
Main 5 MTXC


MTXC IC5
AD[0-31]
C/BE3#
C/BE2#
C/BE1#
C/BE0#
FRAME#
DEVSEL#
IRDY#
TRDY#
STOP#
PLOCK#
REQ3#
REQ2#
REQ1#
REQ0#
GNT3#
GNT2#
GNT1#
GNT0#
PHLD#
PHLDA#
PAR
CLKRUN#
PCIRST#
TESTIN#
HCLKIN
PCLKIN
SYSCLK
SUSSTAT1#
REST#
VCCPU
VCCSUS
VREF
VSS
BGA324(2.3mm)
Intel
VC3
VB3
HCLKMTXC
PCLKTX
C254
C255
C256
C257
C258
C260
C262
C263
C259
C261
C266
10V
10K
R235

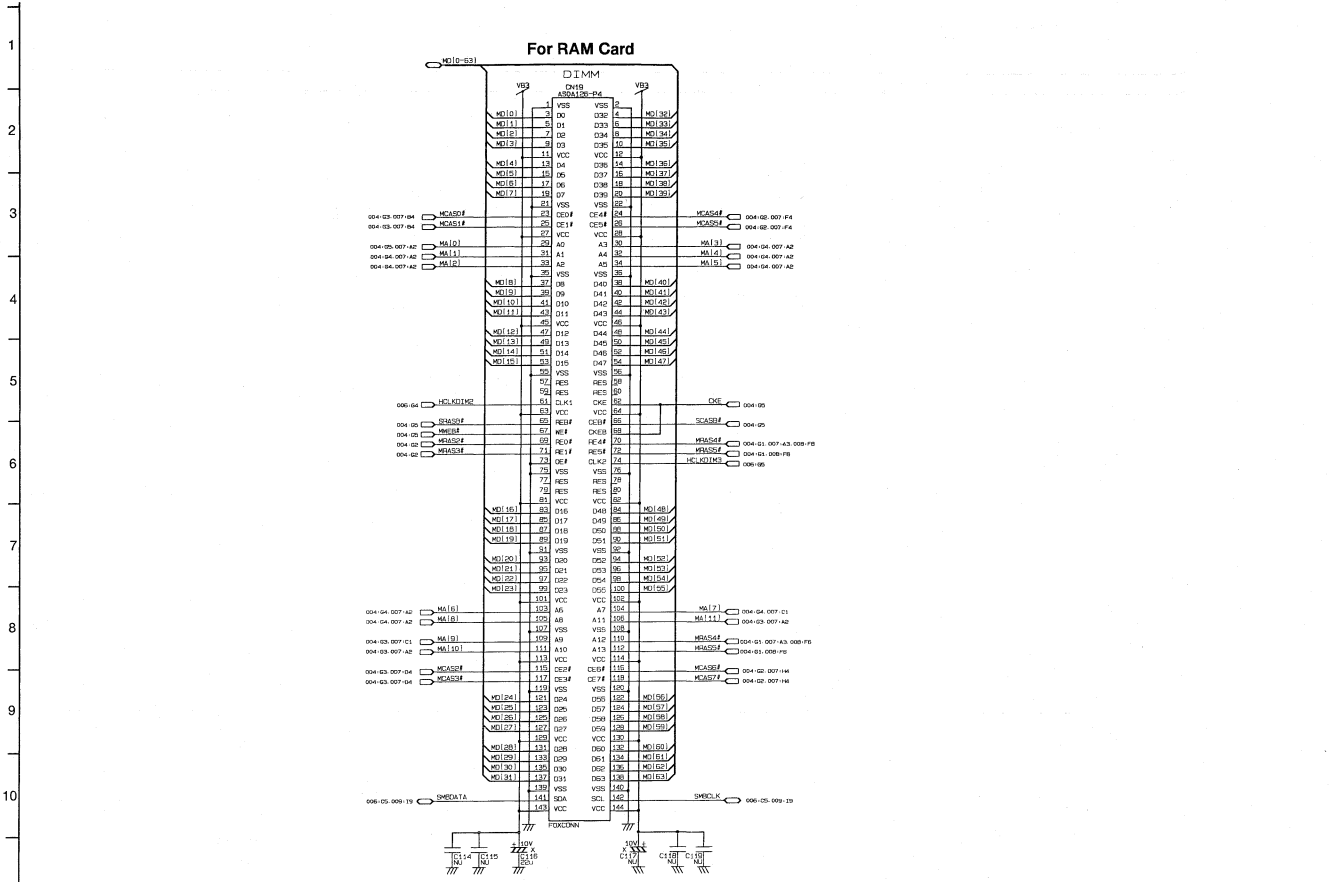
Main 6 Clock



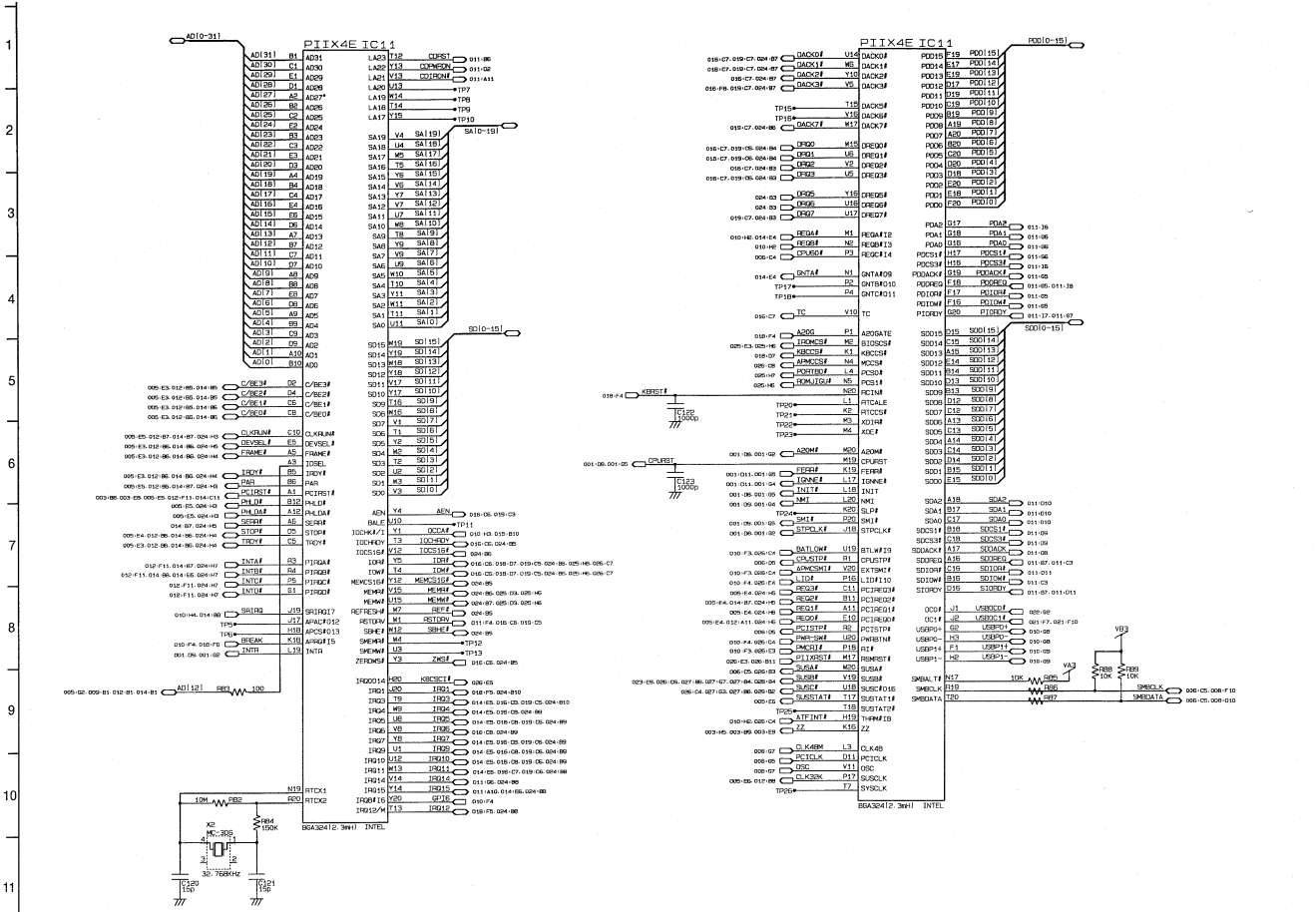
Main 7 Main Memory



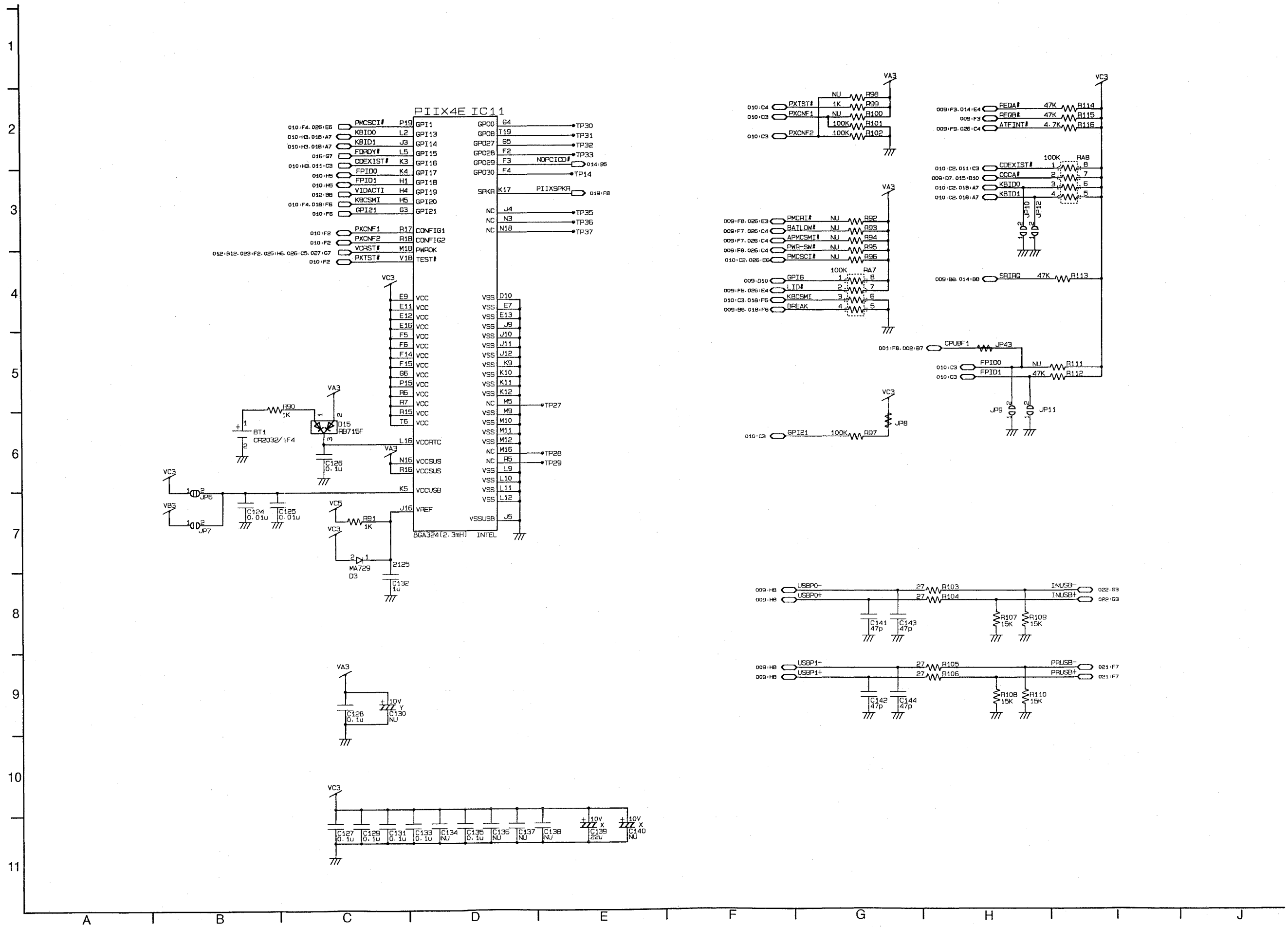
Main 8 RAM Card Connector



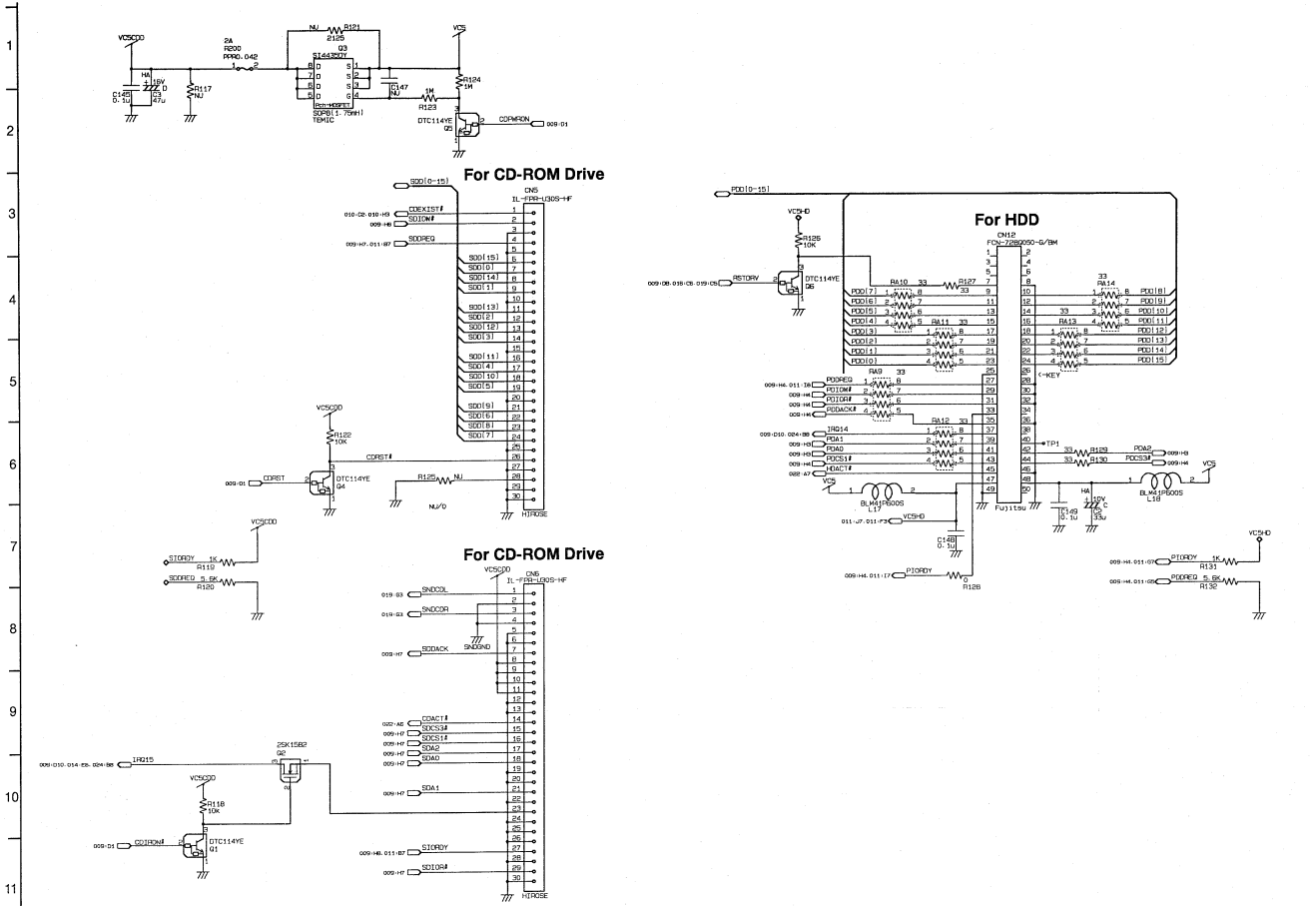
Main 9 PIIX4


PIIX4E IC11
AD[31:0]
SD[15:0]
SA[19:0]
PD[15:0]
BGA324[2.3mm] INTEL
7 - 17
7 - 18

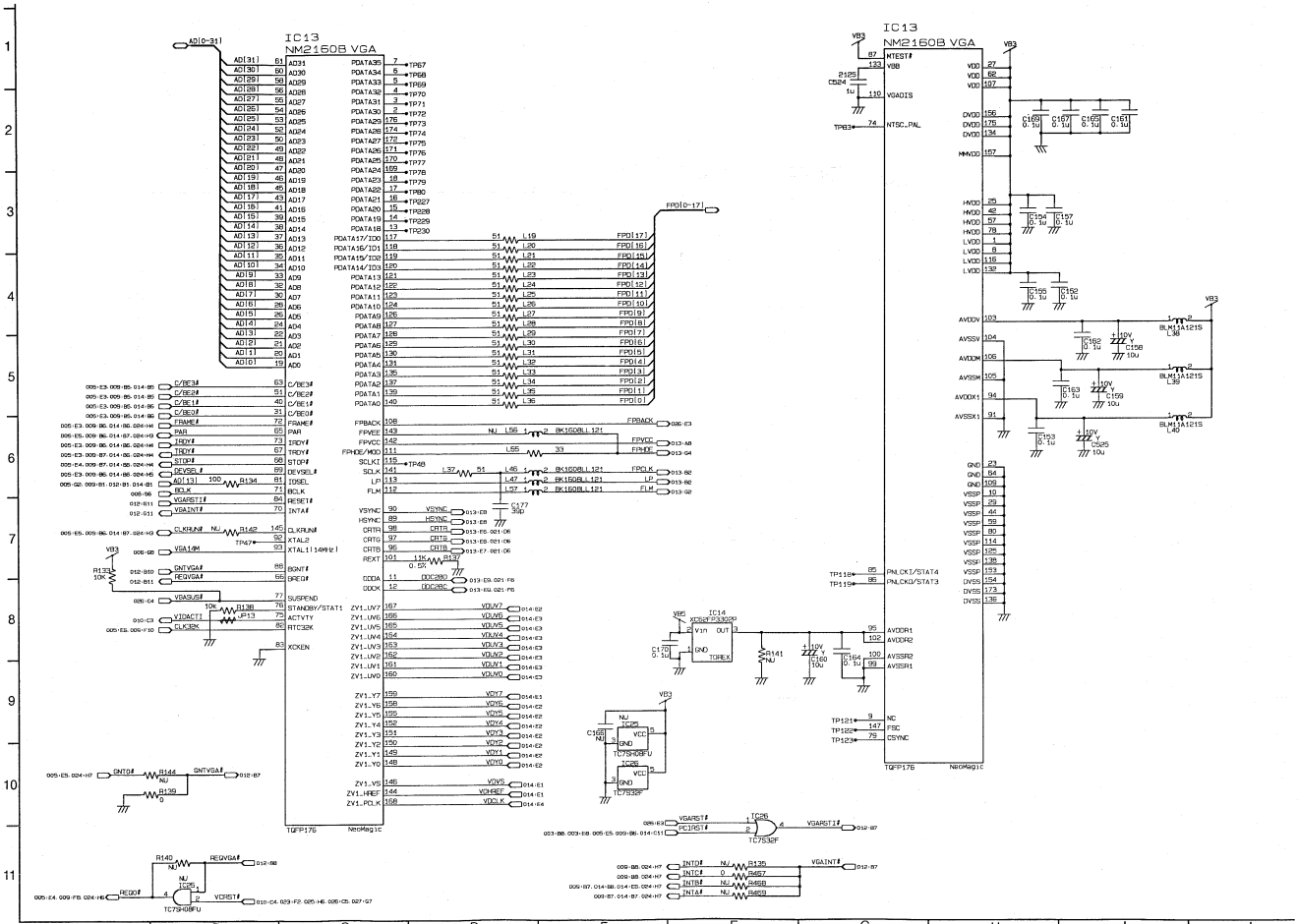
Main 10 PIIX4


PIIX4E IC11
BGA324(2.3mH) INTEL
PMCSCI# P19 GPI1
KBID0 L2 GPI13
KBID1 J3 GPI14
FDRDY# L5 GPI15
CDEXIST# K3 GPI16
FPID0 K4 GPI17
FPID1 H1 GPI18
VIDACTI H4 GPI19
KBCSMI H5 GPI20
GPI21 G3 GPI21
PXCNF1 R17 CONFIG1
PXCNF2 R18 CONFIG2
VCRST# M18 PWROK
PXTST# V18 TEST#
GPO0 G4 TP30
GPO8 T19 TP31
GPO27 G5 TP32
GPO28 F2 TP33
GPO29 F3 NOPCICD# 014:B5
GPO30 F4 TP14
SPKR K17 PIIXSPKR 019:F8
NC J4 TP35
NC N3 TP36
NC N18 TP37
VCC E9 E11 E12 E16 F5 F6 F14 F15 G6 P15 R6 R7 R15 T6
VSS D10 E7 E13 J9 J10 J11 J12 K9 K10 K11 K12 M9 M10 M11 M12 L9 L10 L11 L12
NC M5 TP27
NC M16 TP28
NC R5 TP29
L16 VCCRTC
N16 VCCSUS
R16 VCCSUS
K5 VCCUSB
J16 VREF
VSSUSB J5
R90 1K
BT1 CR2032/1F4
D15 RB715F
C126 0.1u
JP6 JP7
C124 0.01u
C125 0.01u
R91 1K
MA729 D3
2125
C132 1u
C128 0.1u
C130 NU 10V Y
C127 0.1u C129 0.1u C131 0.1u C133 0.1u C134 NU C135 0.1u C136 NU C137 NU C138 NU C139 22u 10V X C140 NU 10V X
PXTST# NU R98 1K R99
PXCNF1 NU R100 100K R101
PXCNF2 100K R102
PMCRI# NU R92
BATLOW# NU R93
APMCSMI# NU R94
PWR-SW# NU R95
PMCSCI# NU R96
100K RA7
GPI6 LID# KBCSMI BREAK
GPI21 100K R97 JP8
REQA# 47K R114
REQB# 47K R115
ATFINT# 4.7K R116
100K RA8
CDEXIST# OCCA# KBID0 KBID1
JP10 JP12
SRIRQ 47K R113
CPUBF1 JP43
FPID0 NU R111
FPID1 47K R112
JP9 JP11
USBP0- 27 R103 INUSB- 022:G3
USBP0+ 27 R104 INUSB+ 022:G3
C141 47p C143 47p R107 15K R109 15K
USBP1- 27 R105 PRUSB- 021:F7
USBP1+ 27 R106 PRUSB+ 021:F7
C142 47p C144 47p R108 15K R110 15K
VC3 VA3 VB3 VC5
A B C D E F G H I J
1 2 3 4 5 6 7 8 9 10 11

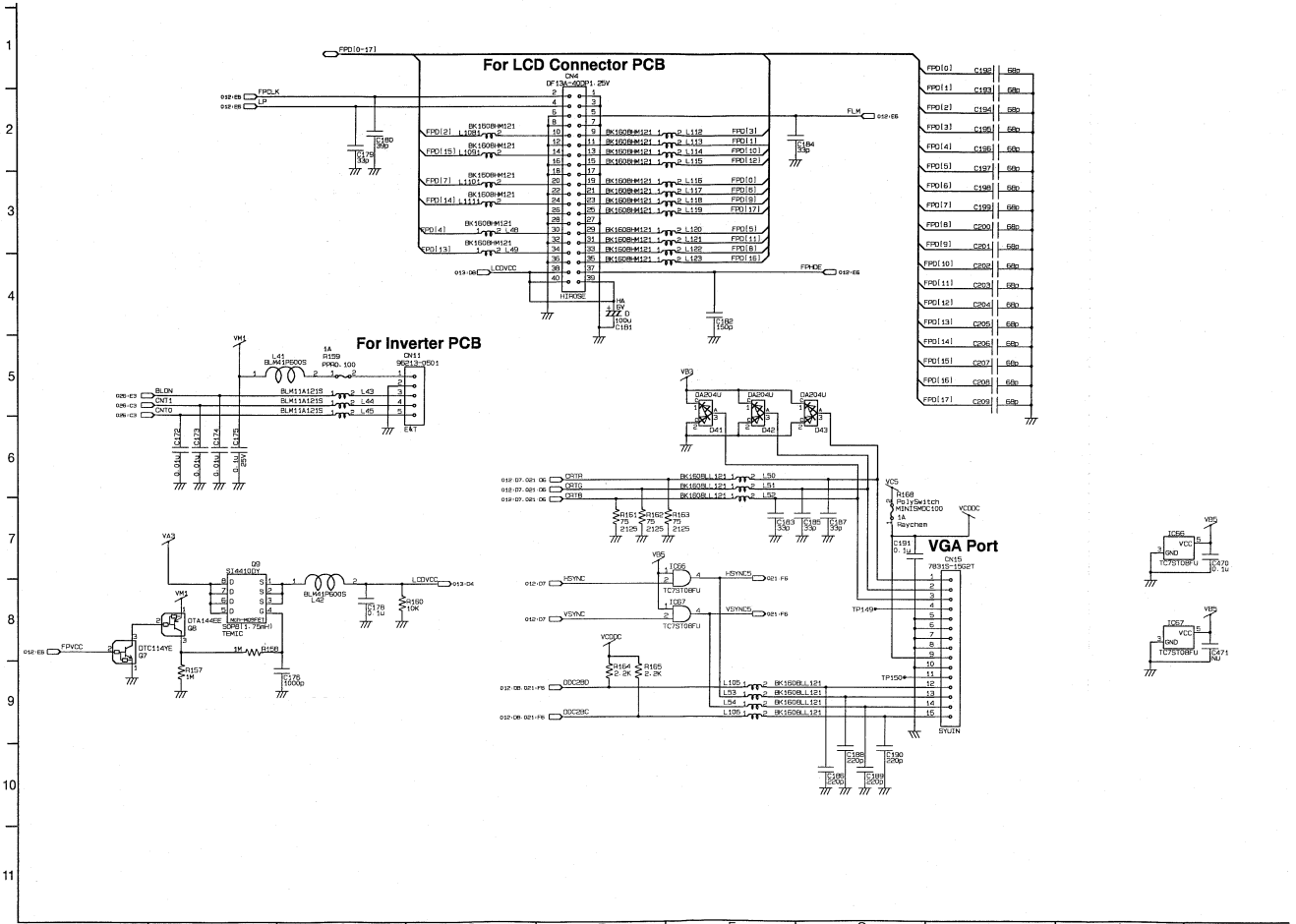
Main 11 CD-ROM Drive, HDD



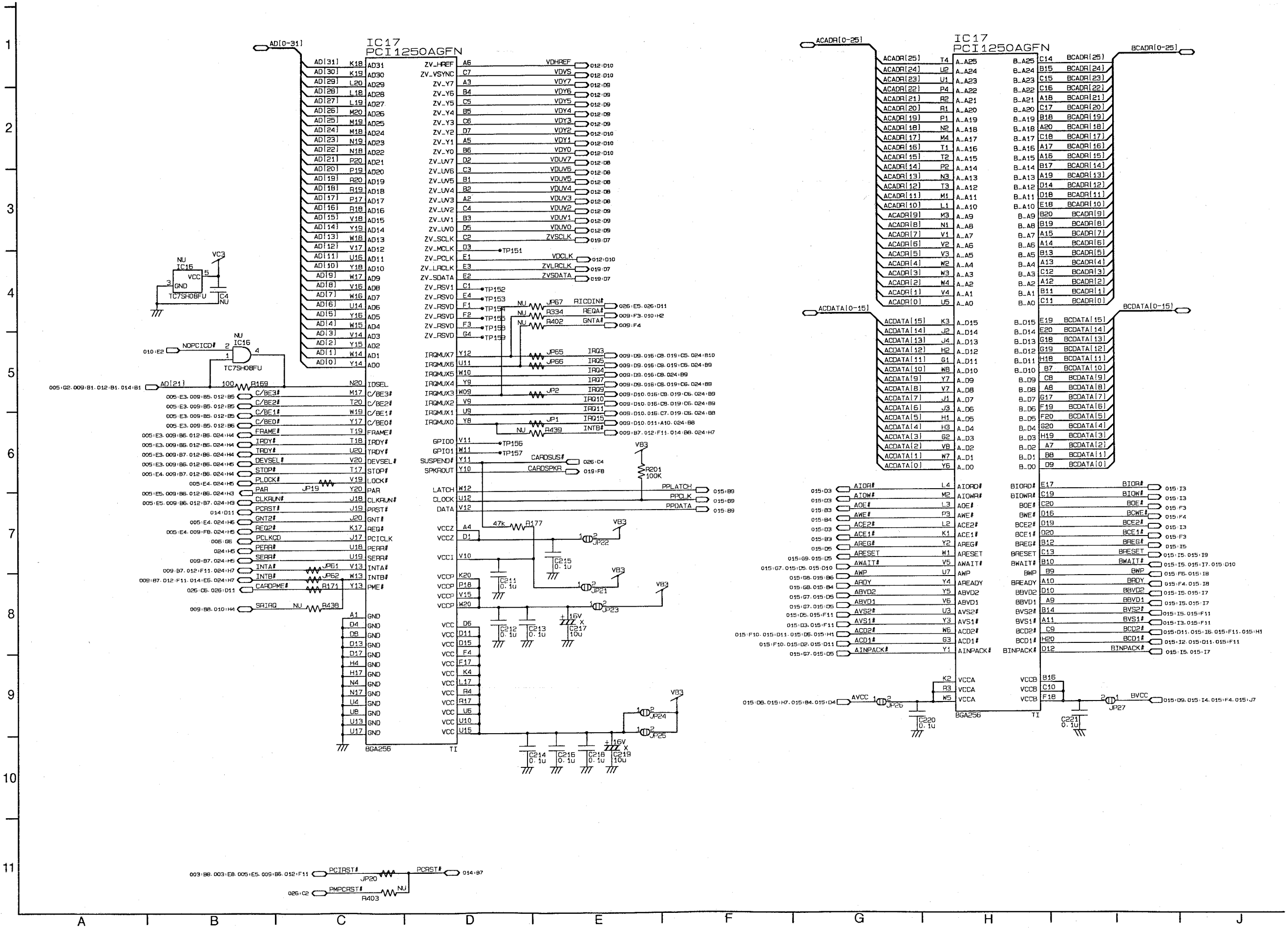
Main 12 VGA


IC13
NM2160B VGA
AD[0-31]
PDATA[0-35]
FPD[0-17]
FPBACK
FPVEE
FPVCC
FPHDE/MOD
SCLK1
LP1
FLM1
VSYNC
HSYNC
CRTR
CRTG
CRTB
REXT
DDCDA
DDCK
ZV1_UV7
ZV1_UV6
ZV1_UV5
ZV1_UV4
ZV1_UV3
ZV1_UV2
ZV1_UV1
ZV1_UV0
ZV1_Y7
ZV1_Y6
ZV1_Y5
ZV1_Y4
ZV1_Y3
ZV1_Y2
ZV1_Y1
ZV1_Y0
ZV1_VS
ZV1_HREF
ZV1_PCLK
C/BE3#
C/BE2#
C/BE1#
C/BE0#
FRAME#
PAR
IRDY#
TRDY#
STOP#
DEVSEL#
IDSEL
RESET#
INTA#
CLKRUN#
XTAL2
XTAL1(14MHz)
BGNT#
BREQ#
SUSPEND
STANDBY/STAT1
ACTVTY
RTC32K
XOSEL
TQFP176
NeoMagic
VB3
NTEST#
VBB
VGADIS
NTSC_PAL
VDD
DVDD
MVDD
LVDD
AVDDV
AVSSV
AVDDM
AVSSM
AVDDX1
AVSSX1
GND
VSSP
DVSS
AVDDR1
AVDDR2
AVSSR2
AVSSR1
PNLCKI/STAT4
PNLCKO/STAT3
NC
FSC
CSYNC
TQFP176
IC14
XOSC/STA32P
VIN
OUT
GND
TQFP8
TC7SH08FU
TC7S32F
VGARST#
PCIRST#
VGAINT#
INTD#
INTC#
INTB#
INTA#

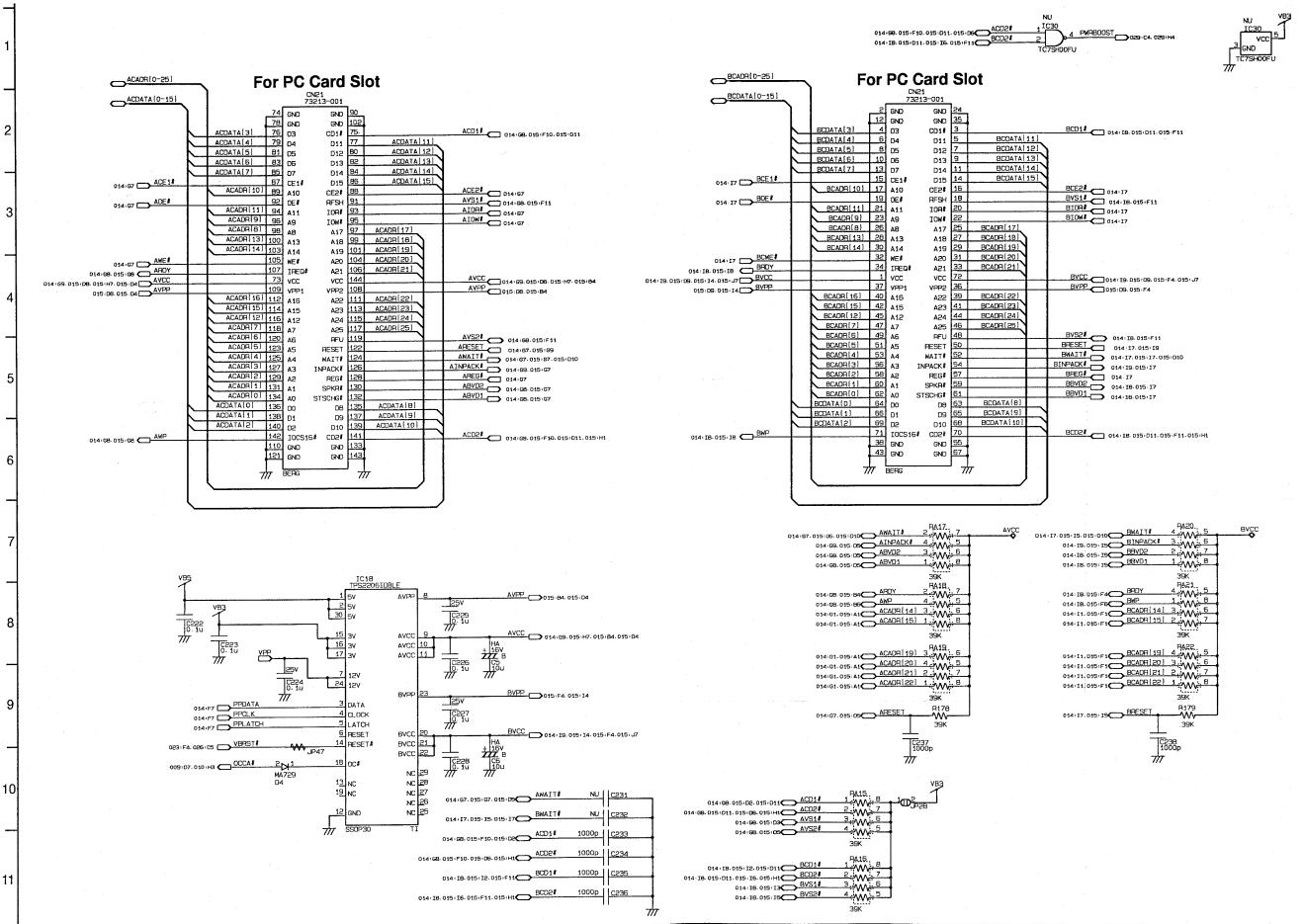
Mian 13 LCD & CRT I/F



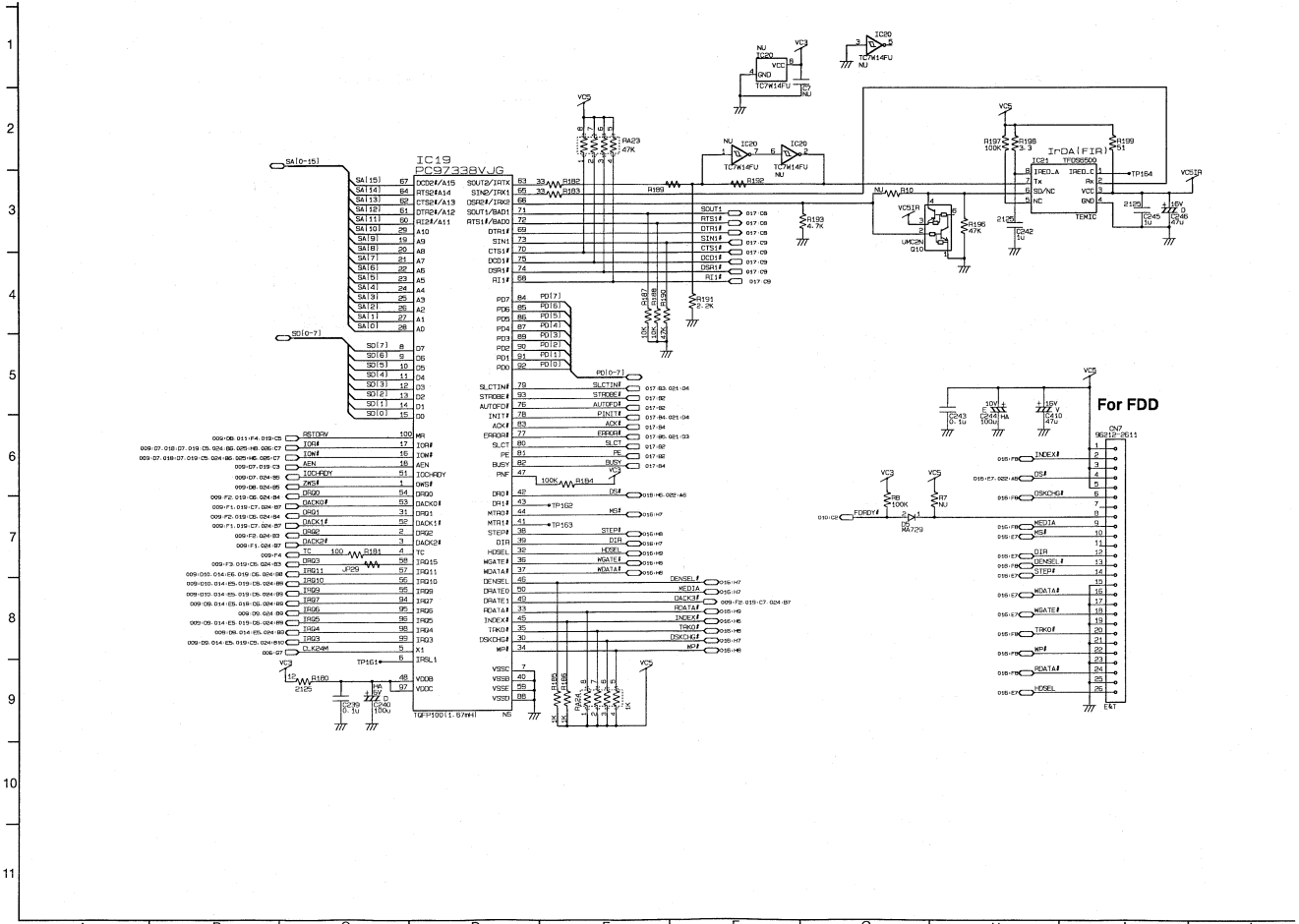
Main 14 PCMCIA Controller


IC17
PCI1250AGFN
AD[0-31]
AD[31] K18 AD31
AD[30] K19 AD30
AD[29] L20 AD29
AD[28] L18 AD28
AD[27] L19 AD27
AD[26] M20 AD26
AD[25] M19 AD25
AD[24] M18 AD24
AD[23] N19 AD23
AD[22] N18 AD22
AD[21] P20 AD21
AD[20] P19 AD20
AD[19] R20 AD19
AD[18] R19 AD18
AD[17] P17 AD17
AD[16] R18 AD16
AD[15] V18 AD15
AD[14] Y19 AD14
AD[13] W18 AD13
AD[12] V17 AD12
AD[11] U16 AD11
AD[10] Y18 AD10
AD[9] W17 AD9
AD[8] V16 AD8
AD[7] W16 AD7
AD[6] U14 AD6
AD[5] Y16 AD5
AD[4] W15 AD4
AD[3] V14 AD3
AD[2] Y15 AD2
AD[1] W14 AD1
AD[0] Y14 AD0
NU IC15 VCC 5 3 GND TC7SH08FU VC3 C4 NU
010:E2 NOPCICD# 2 1 NU IC16 4 TC7SH08FU
005:G2.009:B1.012:B1.014:B1 AD[21] 100 R169 N20 IDSEL
005:E3.009:B5.012:B5 C/BE3# M17 C/BE3#
005:E3.009:B5.012:B5 C/BE2# T20 C/BE2#
005:E3.009:B5.012:B5 C/BE1# W19 C/BE1#
005:E3.009:B5.012:B6 C/BE0# Y17 C/BE0#
005:E3.009:B6.012:B6.024:H4 FRAME# T19 FRAME#
005:E3.009:B6.012:B6.024:H4 IRDY# T18 IRDY#
005:E3.009:B7.012:B6.024:H4 TRDY# U20 TRDY#
005:E3.009:B6.012:B6.024:H5 DEVSEL# V20 DEVSEL#
005:E4.009:B7.012:B6.024:H4 STOP# T17 STOP#
005:E4.024:H5 PLOCK# V19 LOCK#
005:E5.009:B6.012:B6.024:H3 PAR JP19 Y20 PAR
005:E5.009:B6.012:B7.024:H3 CLKRUN# J18 CLKRUN#
014:D11 PCRST# J19 PRST#
005:E4.024:H6 GNT2# J20 GNT#
005:E4.009:F8.024:H5 REQ2# K17 REQ#
006:G6 PCLKCD J17 PCICLK
024:H5 PERR# U18 PERR#
009:B7.024:H5 SERR# U19 SERR#
009:B7.012:F11.024:H7 INTA# JP61 V13 INTA#
009:B7.012:F11.014:E6.024:H7 INTB# JP62 W13 INTB#
025:C6.026:D11 CARDPME# R171 Y13 PME#
009:B8.010:H4 SRIRQ NU R438
A1 D4 D8 D13 D17 H4 H17 N4 N17 U4 U8 U13 U17 GND
BGA256
ZV_HREF A6 VDHREF 012:D10
ZV_VSYNC C7 VDVS 012:D10
ZV_Y7 A3 VDY7 012:D9
ZV_Y6 B4 VDY6 012:D9
ZV_Y5 C5 VDY5 012:D9
ZV_Y4 B5 VDY4 012:D9
ZV_Y3 C6 VDY3 012:D9
ZV_Y2 D7 VDY2 012:D10
ZV_Y1 A5 VDY1 012:D10
ZV_Y0 B6 VDY0 012:D10
ZV_UV7 D2 VDUV7 012:D8
ZV_UV6 C3 VDUV6 012:D8
ZV_UV5 B1 VDUV5 012:D8
ZV_UV4 B2 VDUV4 012:D8
ZV_UV3 A2 VDUV3 012:D8
ZV_UV2 C4 VDUV2 012:D9
ZV_UV1 B3 VDUV1 012:D9
ZV_UV0 D5 VDUV0 012:D9
ZV_SCLK C2 ZVSCLK 019:D7
ZV_MCLK D3 TP151
ZV_PCLK E1 VDCLK 012:D10
ZV_LRCLK E3 ZVLRCLK 019:D7
ZV_SDATA E2 ZVSDATA 019:D7
ZV_RSV1 C1 TP152
ZV_RSV0 E4 TP153
ZV_RSVD F1 TP154 NU JP67 RICDIN# 026:E5.026:D11
ZV_RSVD F2 TP155 NU R334 REQA# 009:F3.010:H2
ZV_RSVD F3 TP158 NU R402 GNTA# 009:F4
ZV_RSVD G4 TP159
IRQMUX7 Y12 JP65 IRQ3 009:D9.016:C8.019:C5.024:B10
IRQMUX6 U11 JP66 IRQ5 009:D9.016:C8.019:C6.024:B9
IRQMUX5 W10 IRQ4 009:D9.016:C8.024:B9
IRQMUX4 Y9 IRQ7 009:D9.016:C8.019:C6.024:B9
IRQMUX3 W09 JP2 IRQ9 009:D10.016:C8.019:C6.024:B9
IRQMUX2 V9 IRQ10 009:D10.016:C8.019:C6.024:B9
IRQMUX1 U9 IRQ11 009:D10.016:C7.019:C6.024:B8
IRQMUX0 Y8 JP1 IRQ15 009:D10.011:A10.024:B8
NU R439 INTB# 009:B7.012:F11.014:B8.024:H7
GPIO0 V11 TP156
GPIO1 W11 TP157
SUSPEND# Y11 CARDSUS# 026:C4
SPKROUT Y10 CARDSPKR 019:F8
VB3 R201 100K
LATCH W12 PPLATCH 015:B9
CLOCK U12 PPCLK 015:B9
DATA V12 PPDATA 015:B9
VCCZ A4 VCCZ D1 47k R177 VB3 JP22 C215 0.1u
VCCI V10 C211 0.1u JP21 VB3
VCCP K20 P18 V15 W20 C212 0.1u C213 0.1u 16V C217 10u JP23 VB3
VCC D6 D11 D15 F4 F17 K4 L17 R4 R17 U6 U10 U15
C214 0.1u C216 0.1u C218 0.1u 16V C219 10u JP24 JP25 VB3
TI
003:B8.003:E8.005:E5.009:B6.012:F11 PCIRST# JP20 PCRST# 014:B7
026:C2 PMPCRST# R403 NU
ACADR[0-25]
ACADR[25] T4 A_A25 B_A25 C14 BCADR[25]
ACADR[24] U2 A_A24 B_A24 B15 BCADR[24]
ACADR[23] U1 A_A23 B_A23 C15 BCADR[23]
ACADR[22] P4 A_A22 B_A22 C16 BCADR[22]
ACADR[21] R2 A_A21 B_A21 A18 BCADR[21]
ACADR[20] R1 A_A20 B_A20 C17 BCADR[20]
ACADR[19] P1 A_A19 B_A19 B18 BCADR[19]
ACADR[18] N2 A_A18 B_A18 A20 BCADR[18]
ACADR[17] M4 A_A17 B_A17 C18 BCADR[17]
ACADR[16] T1 A_A16 B_A16 A17 BCADR[16]
ACADR[15] T2 A_A15 B_A15 A16 BCADR[15]
ACADR[14] P2 A_A14 B_A14 B17 BCADR[14]
ACADR[13] N3 A_A13 B_A13 A19 BCADR[13]
ACADR[12] T3 A_A12 B_A12 D14 BCADR[12]
ACADR[11] M1 A_A11 B_A11 D18 BCADR[11]
ACADR[10] L1 A_A10 B_A10 E18 BCADR[10]
ACADR[9] M3 A_A9 B_A9 B20 BCADR[9]
ACADR[8] N1 A_A8 B_A8 B19 BCADR[8]
ACADR[7] V1 A_A7 B_A7 A15 BCADR[7]
ACADR[6] V2 A_A6 B_A6 A14 BCADR[6]
ACADR[5] V3 A_A5 B_A5 B13 BCADR[5]
ACADR[4] W2 A_A4 B_A4 A13 BCADR[4]
ACADR[3] W3 A_A3 B_A3 C12 BCADR[3]
ACADR[2] W4 A_A2 B_A2 A12 BCADR[2]
ACADR[1] V4 A_A1 B_A1 B11 BCADR[1]
ACADR[0] U5 A_A0 B_A0 C11 BCADR[0]
BCADR[0-25]
ACDATA[0-15]
ACDATA[15] K3 A_D15 B_D15 E19 BCDATA[15]
ACDATA[14] J2 A_D14 B_D14 E20 BCDATA[14]
ACDATA[13] J4 A_D13 B_D13 G18 BCDATA[13]
ACDATA[12] H2 A_D12 B_D12 G19 BCDATA[12]
ACDATA[11] G1 A_D11 B_D11 H18 BCDATA[11]
ACDATA[10] W8 A_D10 B_D10 B7 BCDATA[10]
ACDATA[9] Y7 A_D9 B_D9 C8 BCDATA[9]
ACDATA[8] V7 A_D8 B_D8 A8 BCDATA[8]
ACDATA[7] J1 A_D7 B_D7 G17 BCDATA[7]
ACDATA[6] J3 A_D6 B_D6 F19 BCDATA[6]
ACDATA[5] H1 A_D5 B_D5 F20 BCDATA[5]
ACDATA[4] H3 A_D4 B_D4 G20 BCDATA[4]
ACDATA[3] G2 A_D3 B_D3 H19 BCDATA[3]
ACDATA[2] V8 A_D2 B_D2 A7 BCDATA[2]
ACDATA[1] W7 A_D1 B_D1 B8 BCDATA[1]
ACDATA[0] Y6 A_D0 B_D0 D9 BCDATA[0]
BCDATA[0-15]
015:D3 AIOR# L4 AIORD# BIORD# E17 BIOR# 015:I3
015:D3 AIOW# M2 AIOWR# BIOWR# C19 BIOW# 015:I3
015:B3 AOE# L3 AOE# BOE# C20 BOE# 015:F3
015:B4 AWE# P3 AWE# BWE# D16 BCWE# 015:F4
015:D3 ACE2# L2 ACE2# BCE2# D19 BCE2# 015:I3
015:B3 ACE1# K1 ACE1# BCE1# D20 BCE1# 015:F3
015:D5 AREG# Y2 AREG# BREG# B12 BREG# 015:I5
015:G9.015:D5 ARESET W1 ARESET BRESET C13 BRESET 015:I5.015:I9
015:G7.015:D5.015:D10 AWAIT# V5 AWAIT# BWAIT# B10 BWAIT# 015:I5.015:I7.015:D10
015:G8.015:B6 AWP U7 AWP BWP B9 BWP 015:F6.015:I8
015:G8.015:B4 ARDY Y4 AREADY BREADY A10 BRDY 015:F4.015:I8
015:G7.015:D5 ABVD2 Y5 ABVD2 BBVD2 D10 BBVD2 015:I5.015:I7
015:G7.015:D5 ABVD1 V6 ABVD1 BBVD1 A9 BBVD1 015:I5.015:I7
015:D5.015:F11 AVS2# U3 AVS2# BVS2# B14 BVS2# 015:I5.015:F11
015:D3.015:F11 AVS1# Y3 AVS1# BVS1# A11 BVS1# 015:I3.015:F11
015:F10.015:D11.015:D6.015:H1 ACD2# W6 ACD2# BCD2# C9 BCD2# 015:D11.015:I6.015:F11.015:H1
015:F10.015:D2.015:D11 ACD1# G3 ACD1# BCD1# H20 BCD1# 015:I2.015:D11.015:F11
015:G7.015:D5 AINPACK# Y1 AINPACK# BINPACK# D12 BINPACK# 015:I5.015:I7
K2 VCCA R3 VCCA W5 VCCA
015:D8.015:H7.015:B4.015:D4 AVCC JP26 C220 0.1u
VCCB B16 VCCB C10 VCCB F18 C221 0.1u JP27 BVCC 015:D9.015:I4.015:F4.015:J7
BGA256 TI
1 2 3 4 5 6 7 8 9 10 11
A B C D E F G H I J

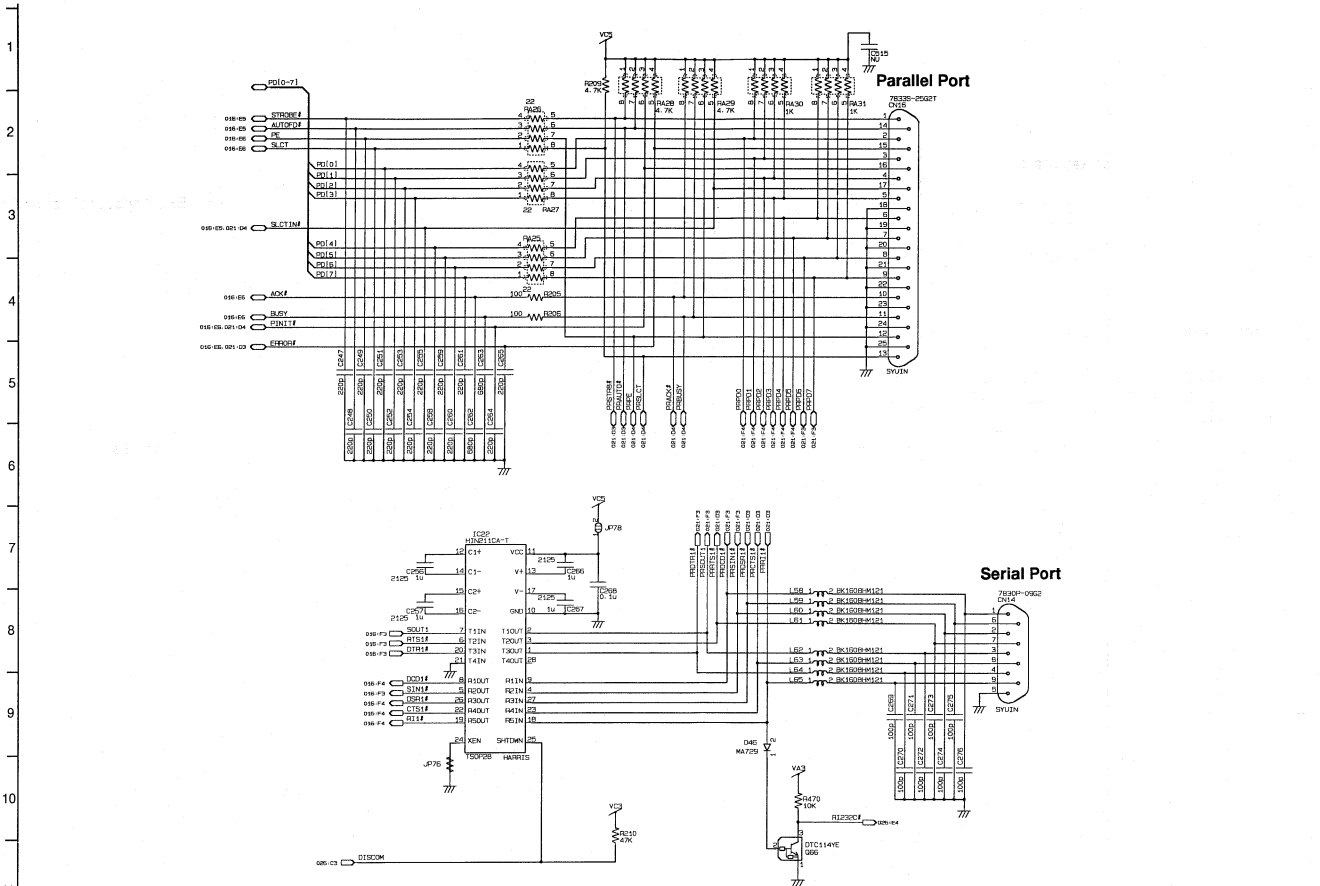
Main 15 PCMCIA I/F



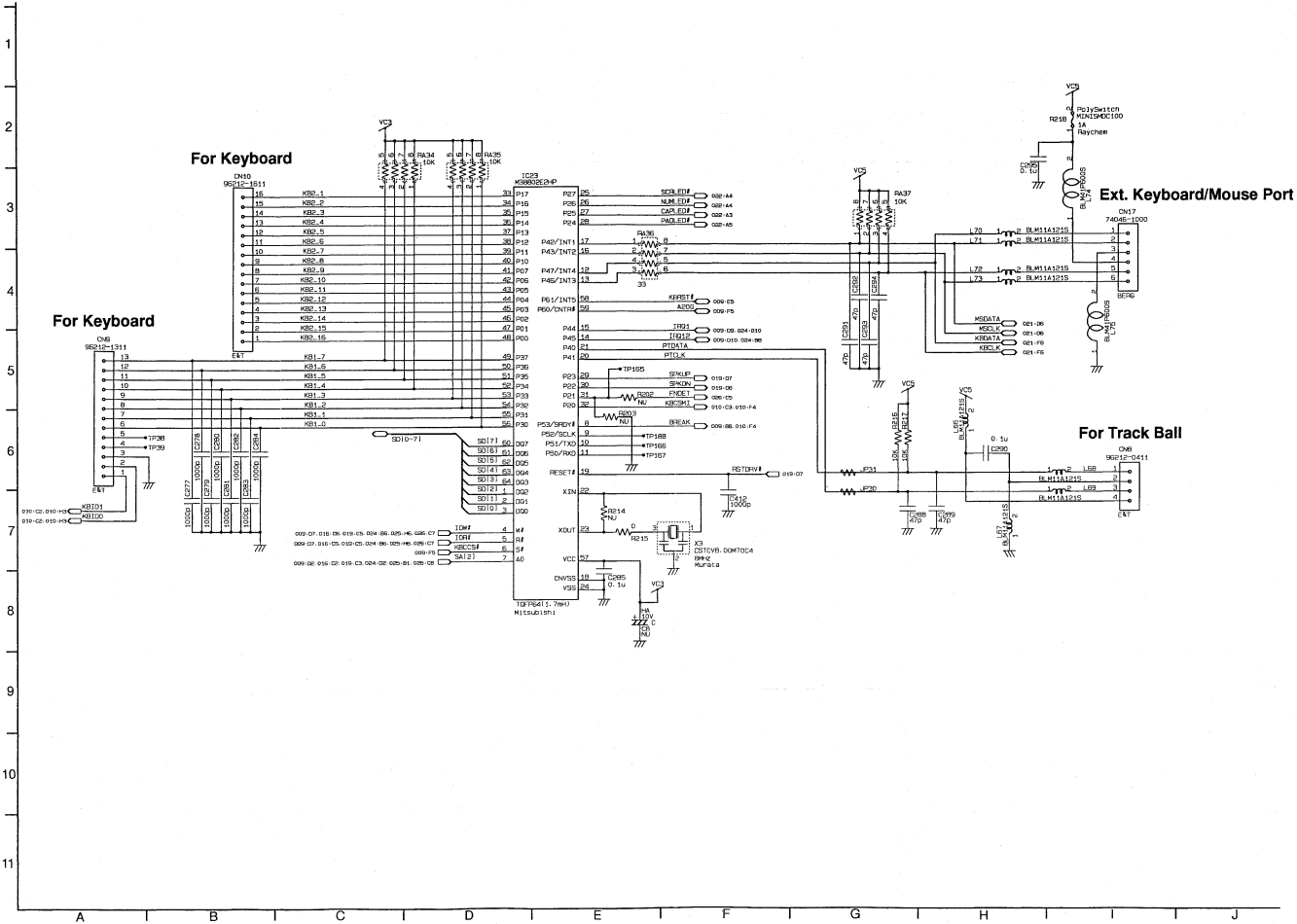
Main 16 Super I/O FDD



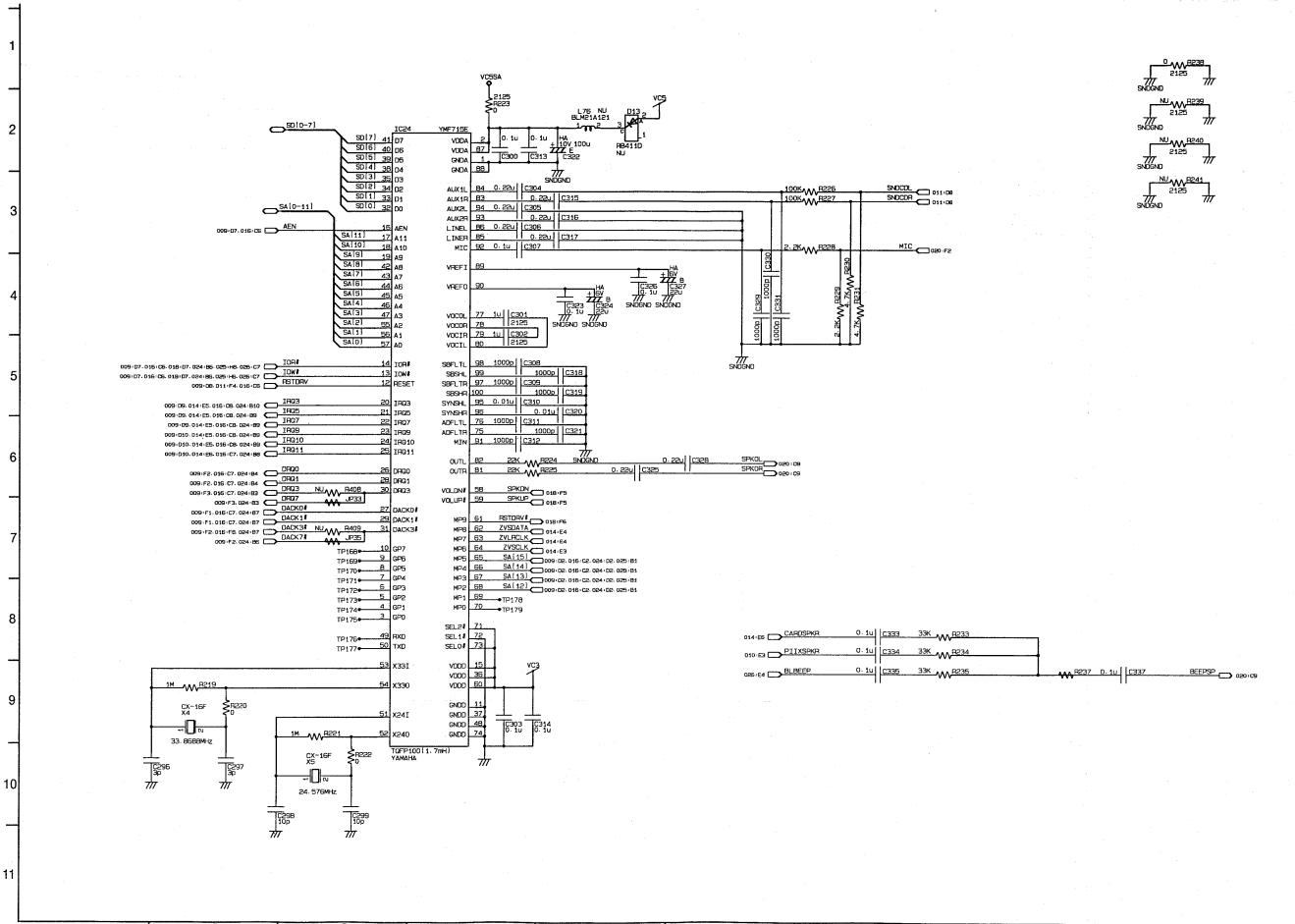
Main 17 Parallel/Serial



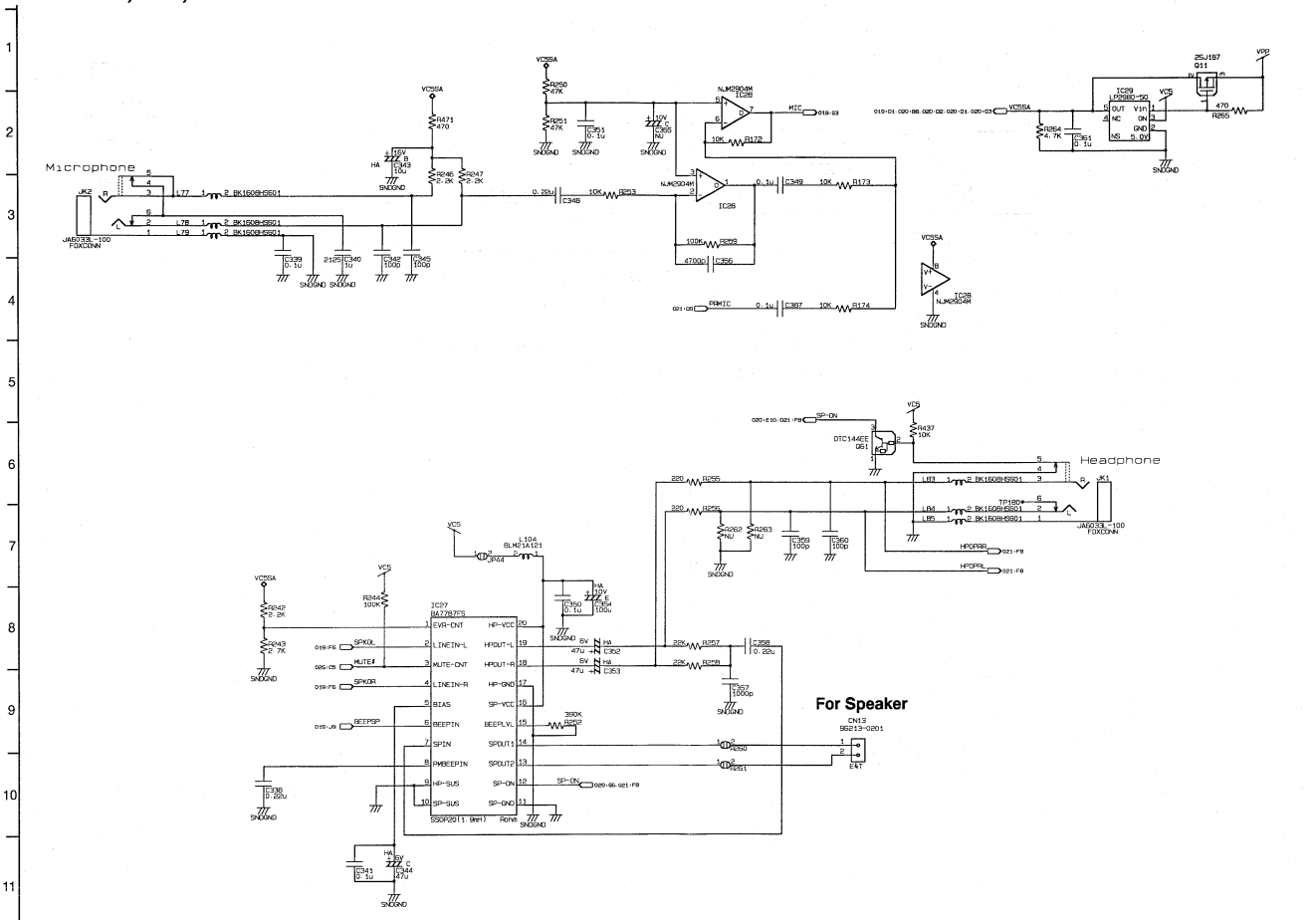
Main 18 KBC


For Keyboard
For Keyboard
Ext. Keyboard/Mouse Port
For Track Ball
CN10 98212-1611
CN9 98212-1311
CN17 74045-1000
CN8 98212-0411
IC23 KS8920CHP
TQFP64I5.7MM1
Mitsubishi
X3 CSTCV8.00MTOC4 8MHz Murata
RA34 10K
RA35 10K
RA36 33
RA37 10K
PolySwitch MINISMDC100 1A Raychem
BLM11A121S
KB2-1
KB2-2
KB2-3
KB2-4
KB2-5
KB2-6
KB2-7
KB2-8
KB2-9
KB2-10
KB2-11
KB2-12
KB2-13
KB2-14
KB2-15
KB2-16
KB1-7
KB1-6
KB1-5
KB1-4
KB1-3
KB1-2
KB1-1
KB1-0
SD[0-7]
SCRLED#
NUMLED#
CAPLED#
PADLED#
KBRST#
A20G
IRQ1
IRQ12
PTDATA
PTCLK
SPKUP
SPKDN
FNDET
KBCSMI
BREAK
RESET#
XIN
XOUT
VCC
CNVSS
VSS
IOW#
IOR#
KBECS#
SA[2]
MSDATA
MSCLK
KBDATA
KBCLK
RSTDRV#
TP412 1000p
C290 0.1u
C285 0.1u
C288 470
C289 470
C291 470
C292 470
C294 470
C295 470
C278 1000p
C279 1000p
C280 1000p
C282 1000p
C283 1000p
C284 1000p
C277 1000p
R214 0
R215 0
R202 NU
R209 NU
R216 NU
R217 NU
R218 NU
R219 NU
R220 10K
R221 10K
R222 10K
R223 10K
R224 10K
R225 10K
R226 10K
R227 10K
L70 BLM11A121S
L71 BLM11A121S
L72 BLM11A121S
L73 BLM11A121S
L74 BLM11A121S
L75 BLM11A121S
L67 BLM11A121S
L68 BLM11A121S
L69 BLM11A121S
L66 BLM11A121S
KBID1
KBID0
TP38
TP39
TP165
TP166
TP167
TP188
JP31
JP30
7 - 35
7 - 36

Main 19 Sound IC

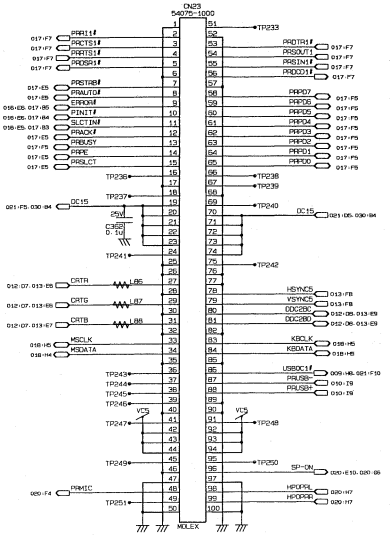


Main 20 MIC, SPK, H-Phone

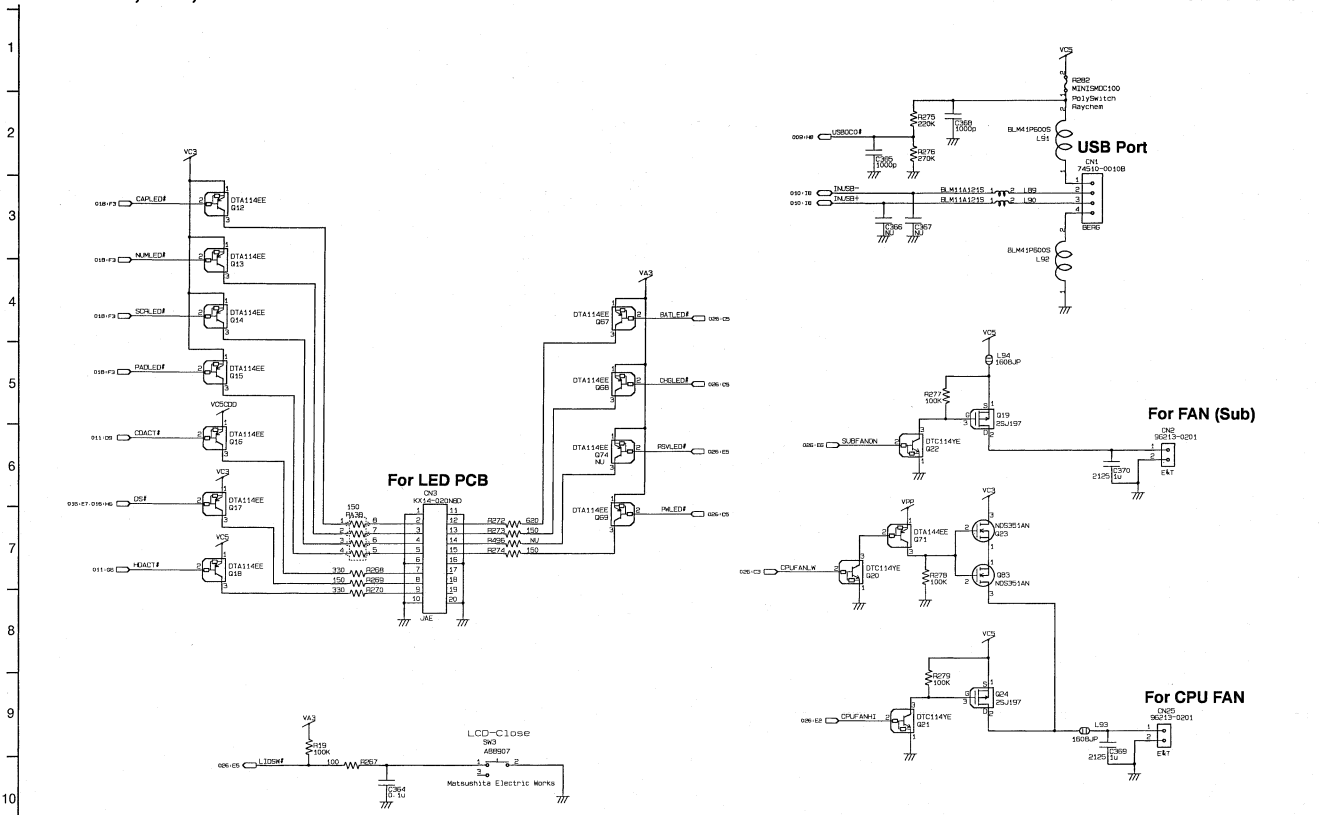


Main 21 Port Replicator Connector

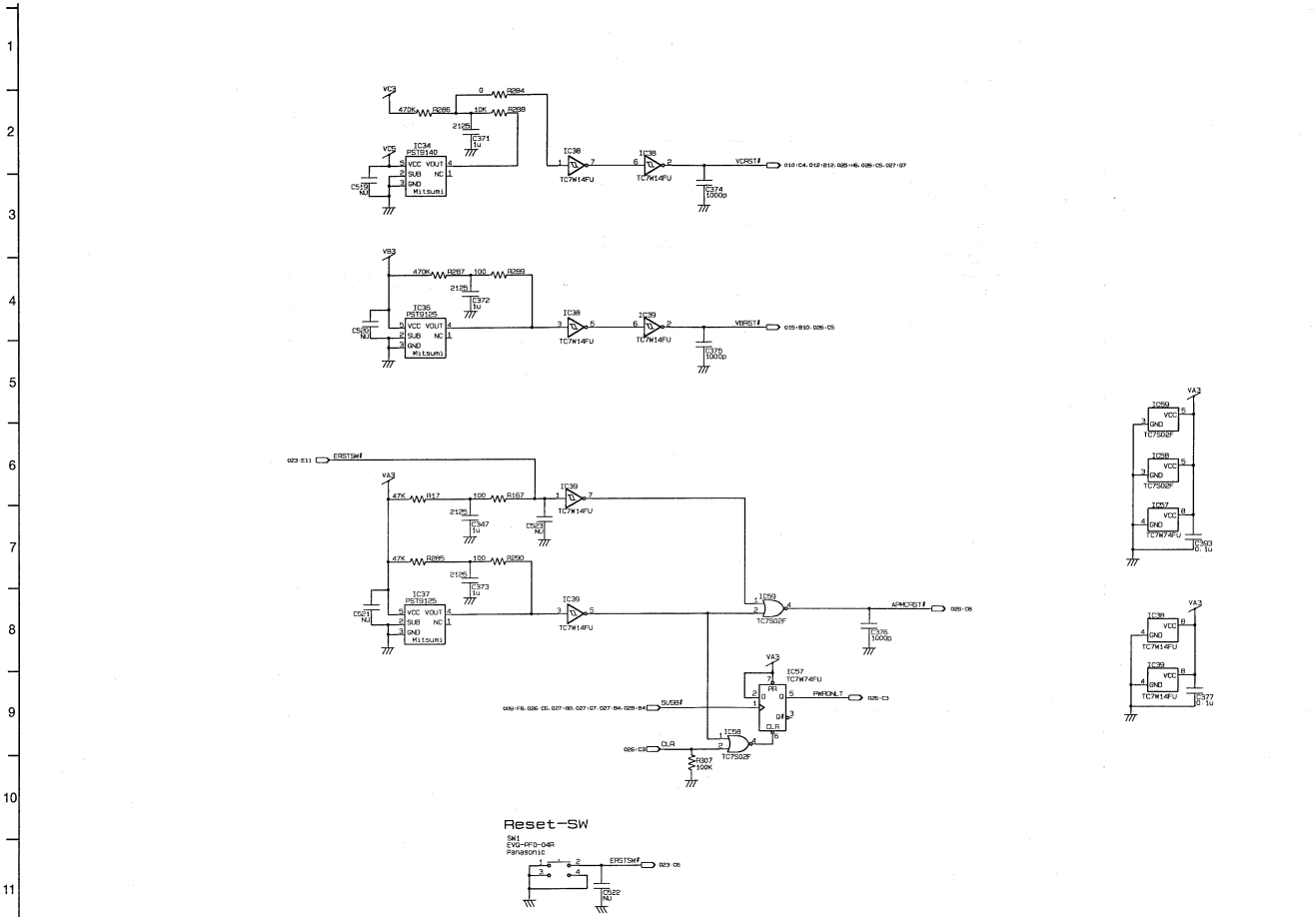
For Port Replicator



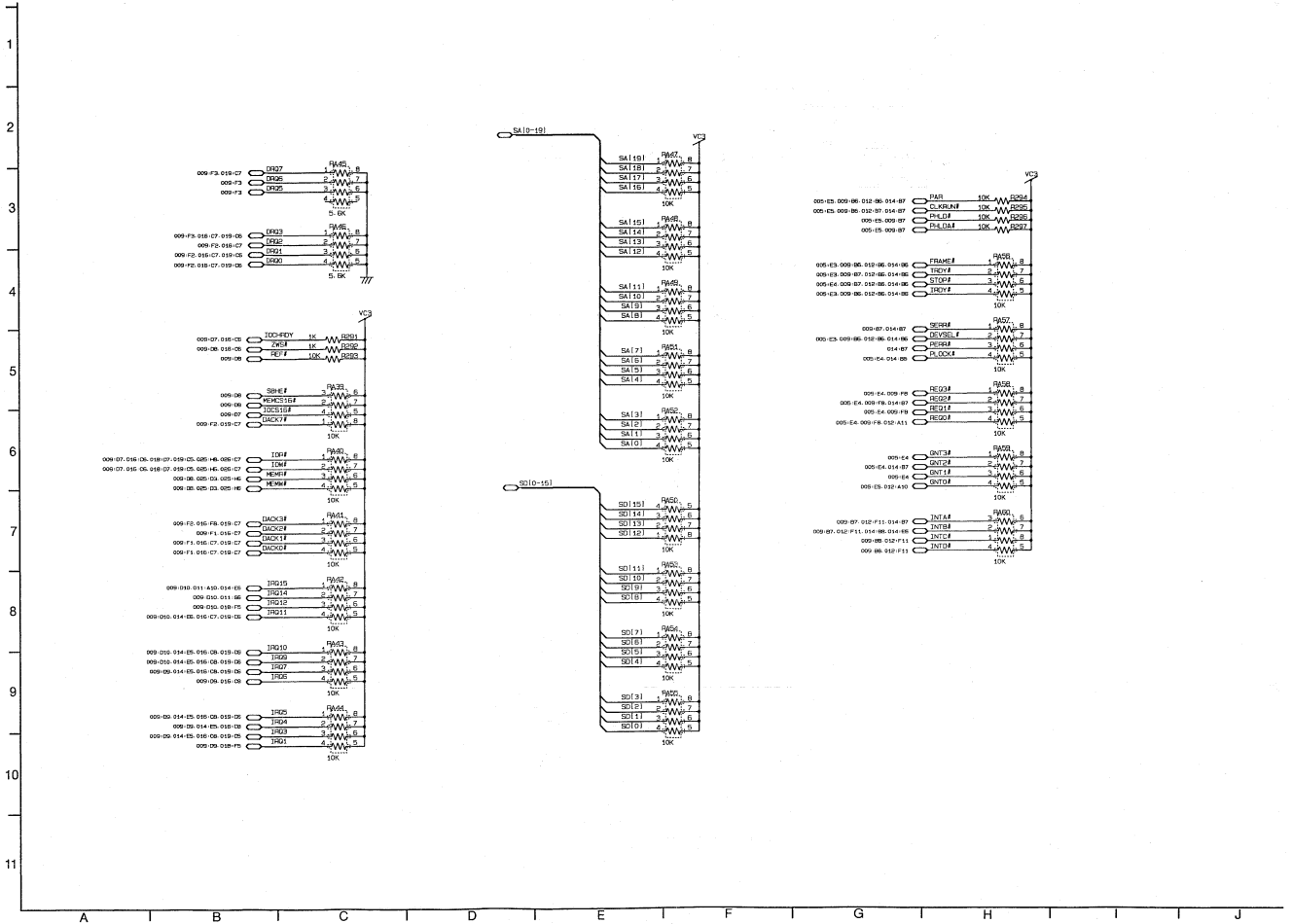
Main 22 LED, USB, FAN



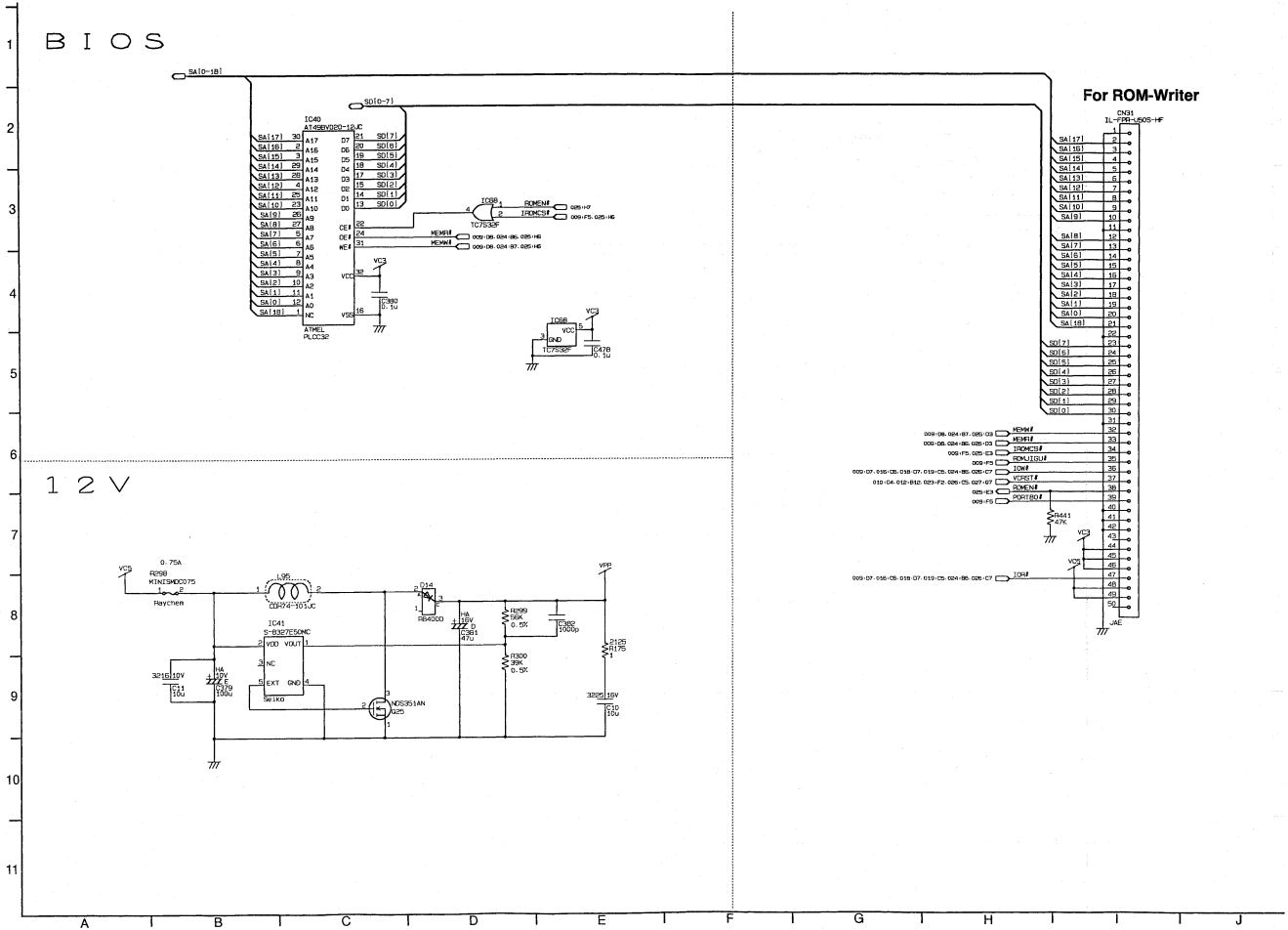
Main 23 Reset



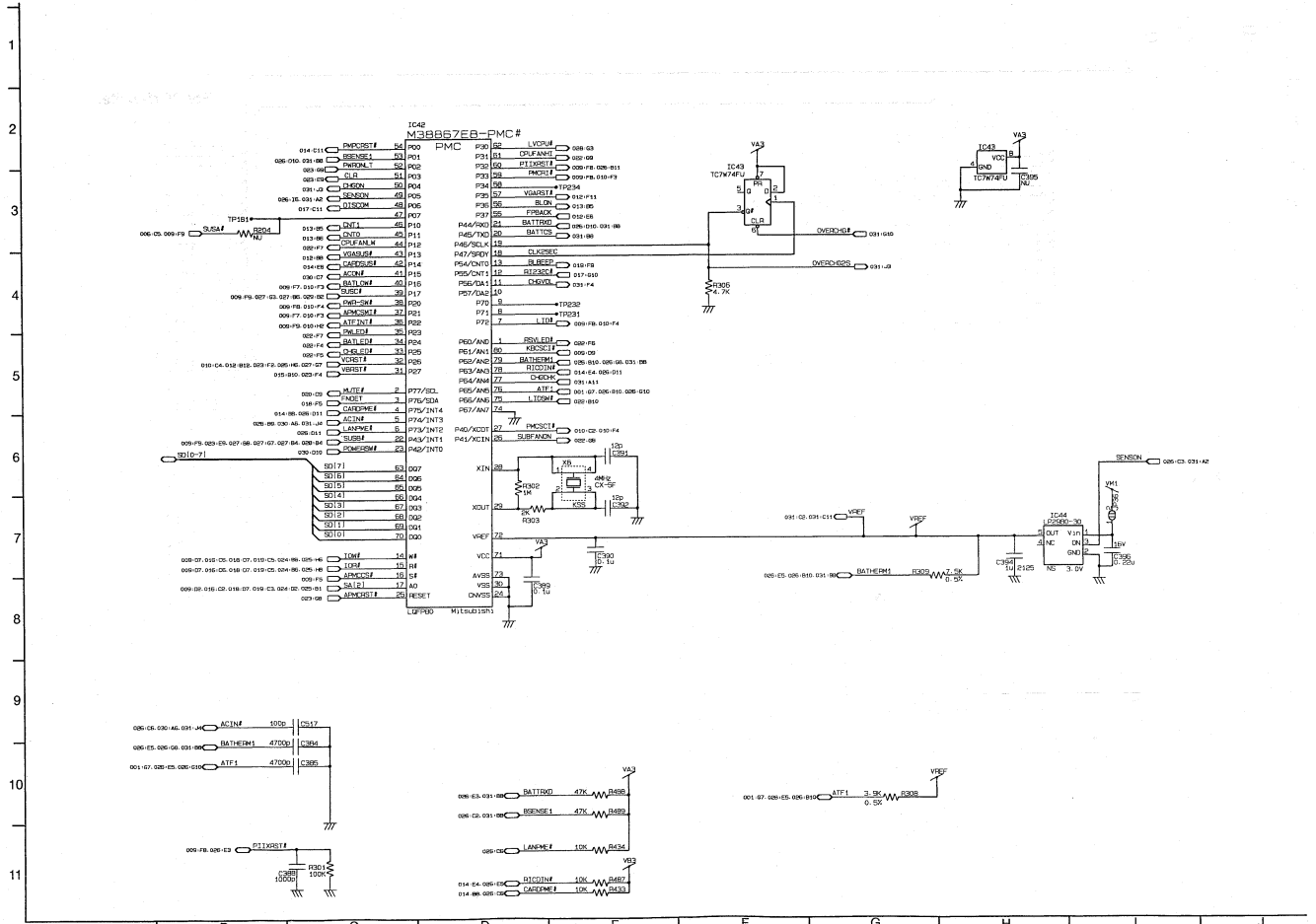
Main 24 Resistors



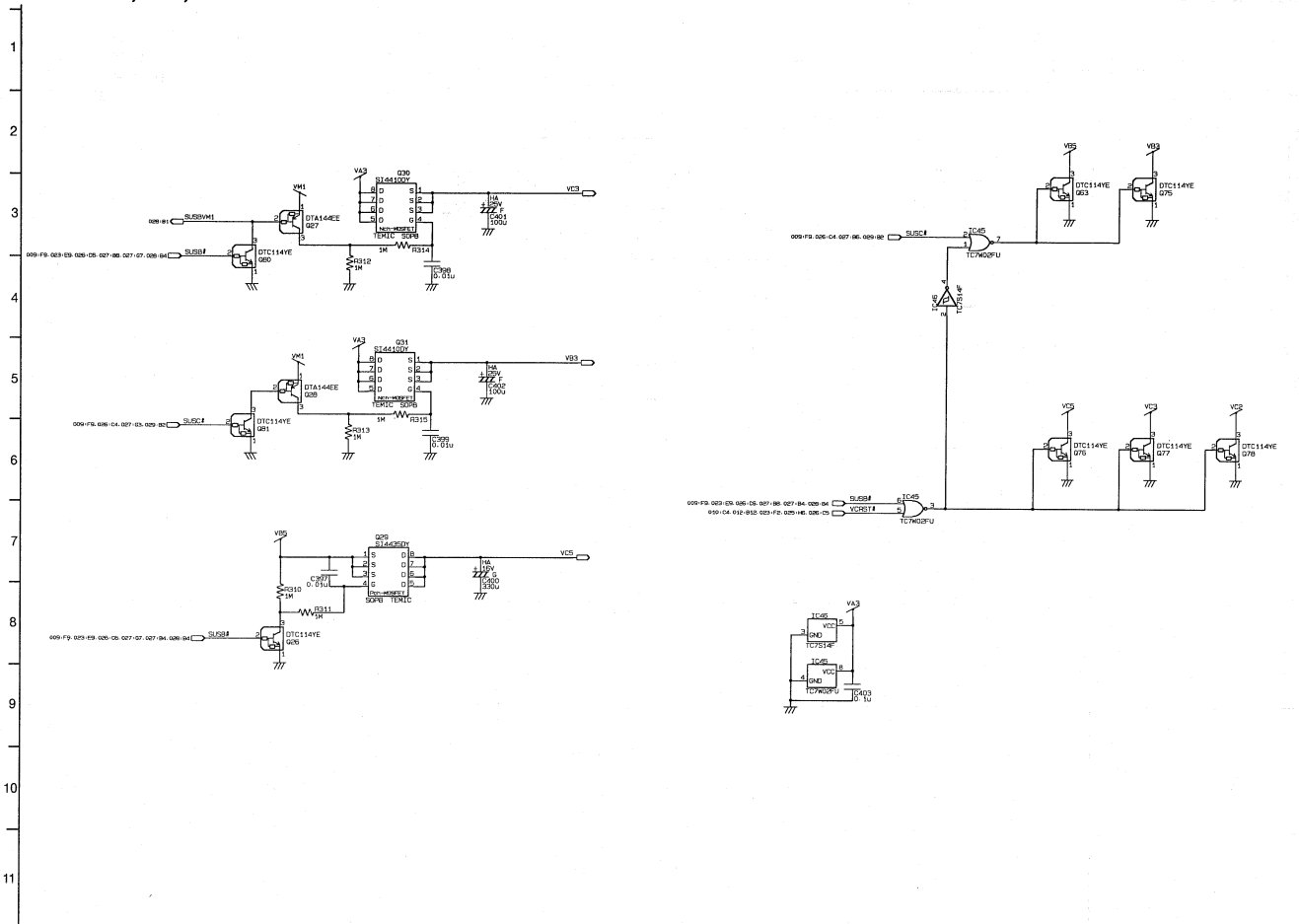
Main 25 BIOS, VPP (12V)



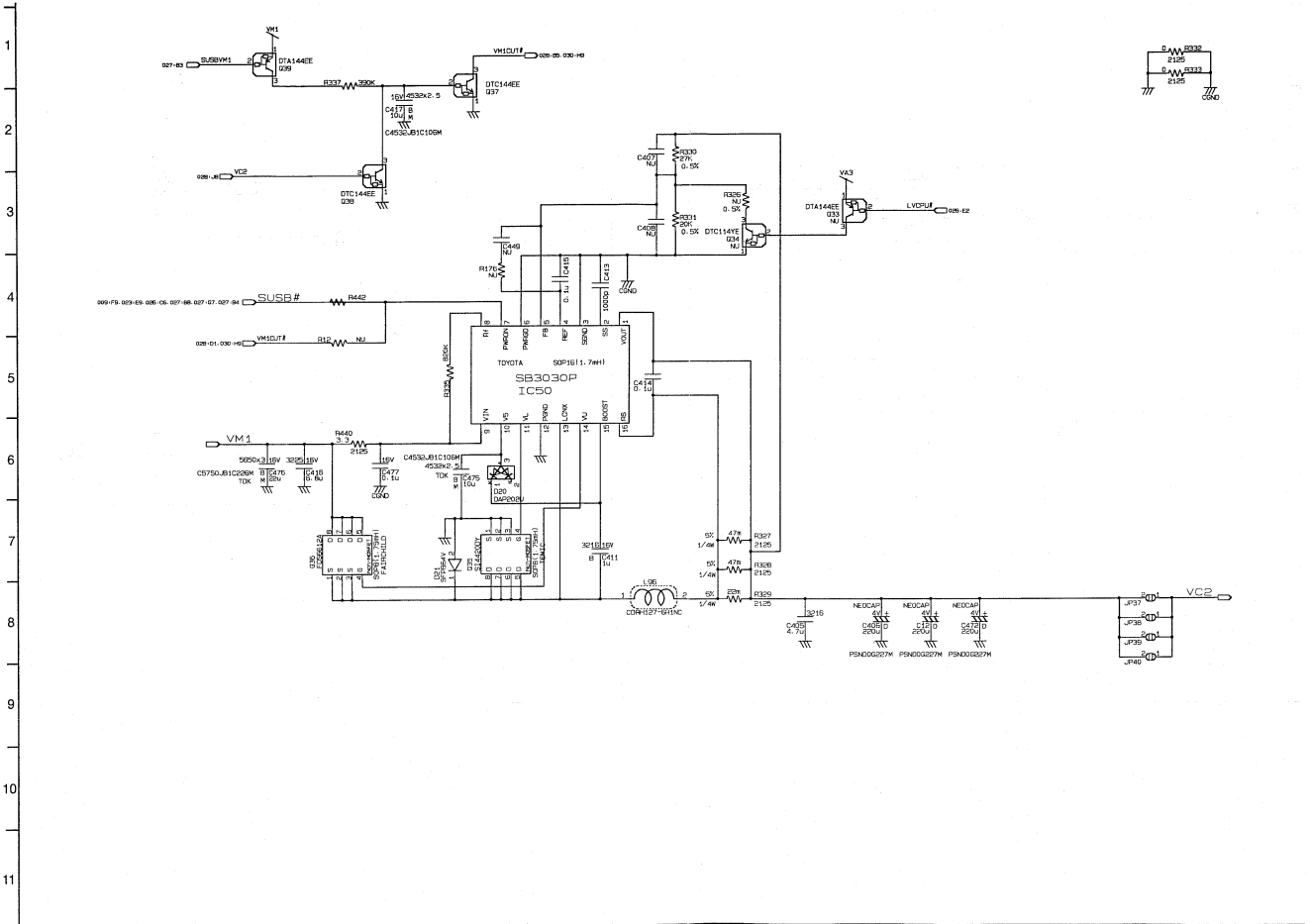
Main 26 PMC


IC42
M38857E8-PMC#
PMC
TP181
SUSA#
R804
4M
PWRONRST#
RSENSE1
PWRON_T
CLR
CHGON
SENSON
DISCOM
CNT1
CNT0
CPUFANLM
VGASUSF
CARDSUSF
ACON#
BATLOW#
SUSD#
PWD-SW#
APMSCI#
ATFINT#
PWLED#
BATLED#
CHGLED#
VCRST#
VERST#
MUTE#
CNDET
CARDPME#
ACIN#
LANPME#
SUSB#
POWERM#
SD[7:0]
XIN
XOUT
VREF
VCC
AVSS
VSS
DNVSS
RESET
LCPD0
M[15:0]
R302
1M
R303
8K
XB
4MHz
CX-5F
KSS
C391
12p
C392
12p
C390
0.1u
C389
0.1u
IC43
TC7W74FU
R305
4.7K
OVERCHG#
OVERCHG2S
IC43
TC7W74FU
IC44
LP2980-30
C393
1u
C395
1u
C396
0.22u
SENSON
VM1
R308
3.9K
0.5K
R309
7.5K
0.5K
BATTHERM1
VREF
ACIN#
100p
C517
BATTHERM1
4700p
C394
ATF1
4700p
C385
PTIXRST#
C388
1000p
R301
100K
BATTRXD
47K
R498
RSENSE1
47K
R499
LANPME#
10K
R434
RICDTN#
10K
R497
CARDPME#
10K
R433
ATF1
3.9K
0.5K
R308

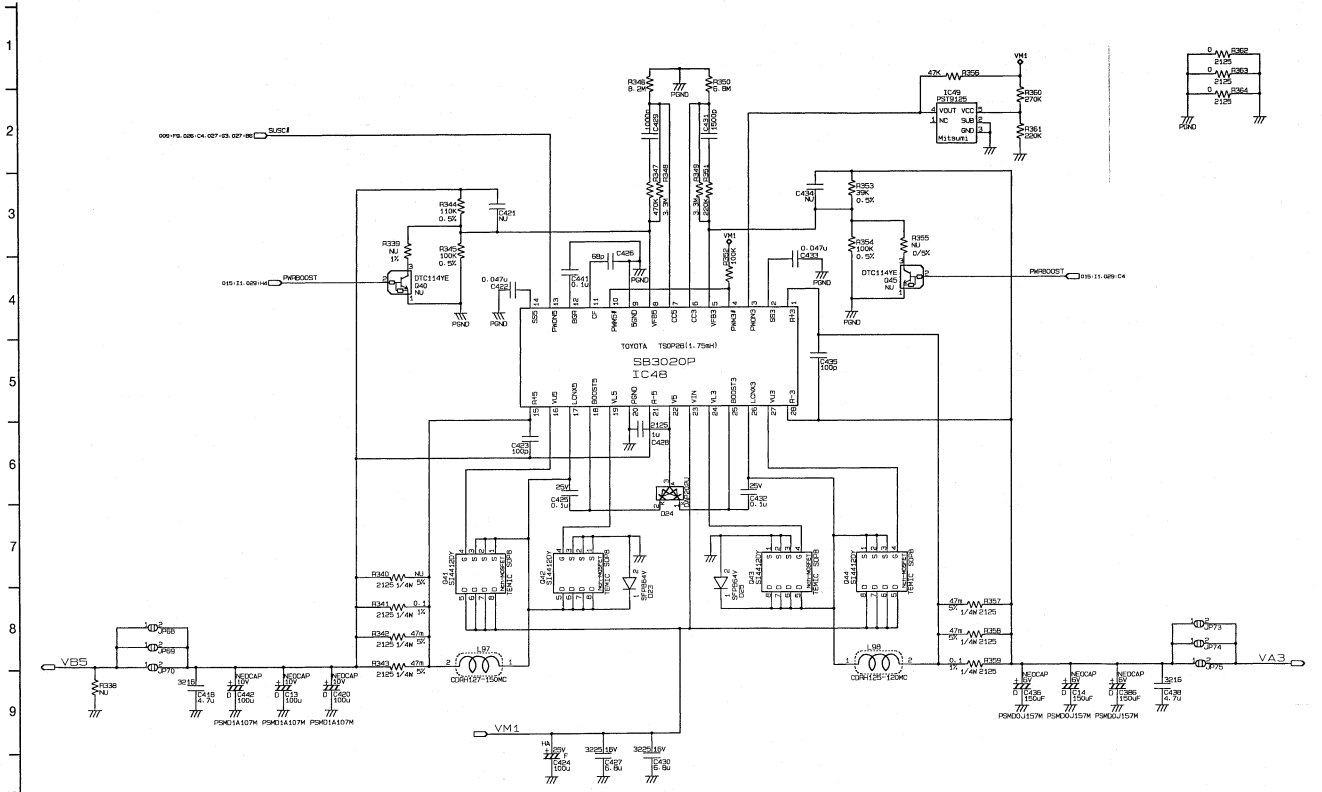
Main 27 VC3, VB3, VC5



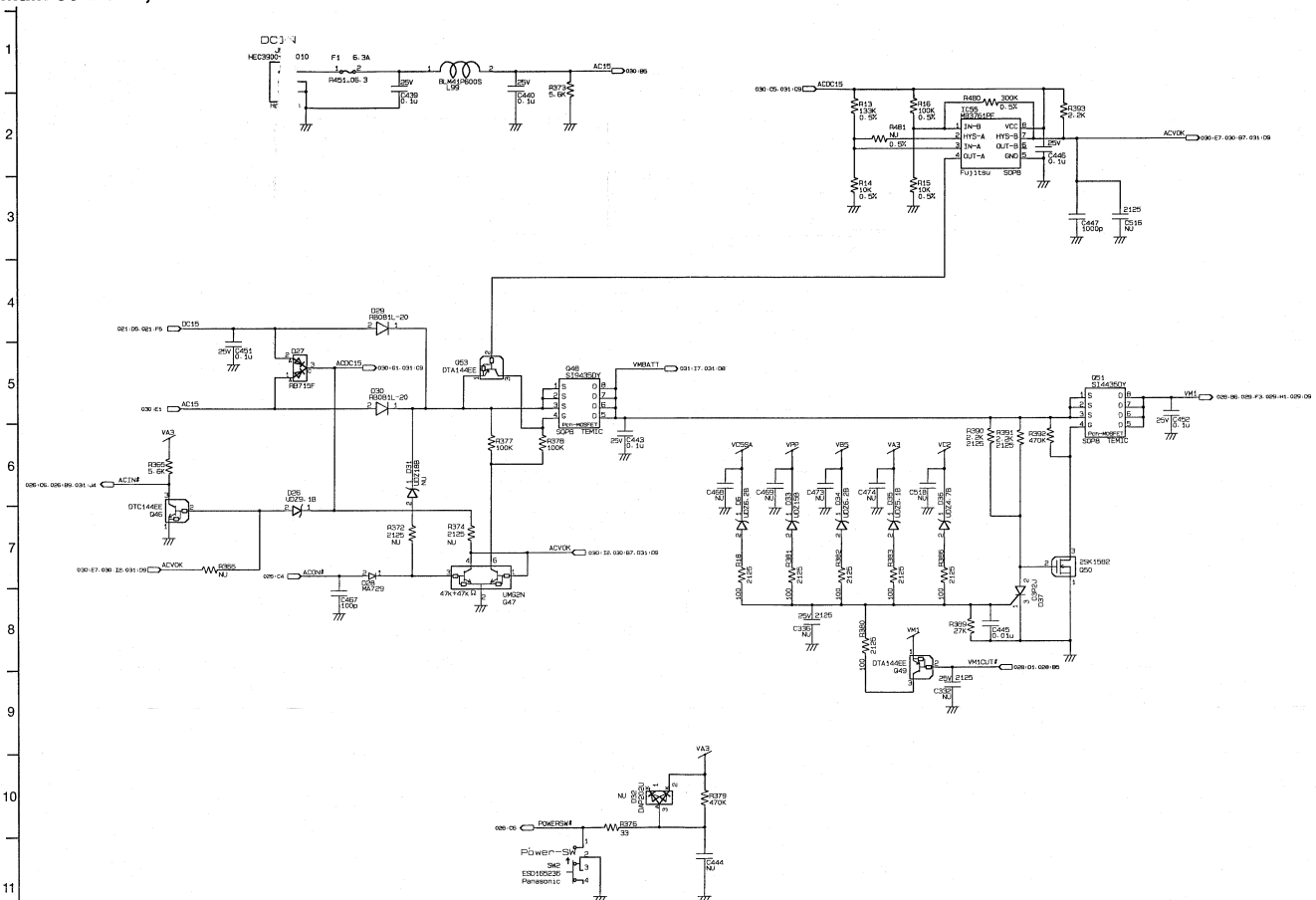
Main 28 VC2


VM1
SUSBVM1
DTA144EE
Q29
R337 390K
VM1CUT#
DTC144EE
Q37
C4532JB1C106M
VC2
DTC144EE
Q38
R330 27K 0.5%
C407 NU
R331 20K 0.5%
C408 NU
R335 NU 0.5%
DTC114YE
Q34 NU
VA3
DTA144EE
Q33 NU
LVCPU#
C449 NU
R176 NU
C415 0.1u
C413 1000p
COND
SUSB#
R442
VM1CUT#
R12 NU
R435 330K
TOYOTA SOP16(1.7mm)
SB3030P
IC50
C414 0.1u
R440 3.3
2125
C5750JB1C226M
C476 M
C418 0.1u
C477 0.1u
C475 10u
D20 DAP202U
C411 1u
L96 CDRH127-6R1NC
R327 47R 1/4W 2125
R328 47R 1/4W 2125
R329 22R 1/4W 2125
C405 4.7u
C406 220u
C412 220u
C413 220u
NEOCAP
PSND0G227M
R332 0 2125
R333 0 2125
JP37
JP38
JP39
JP40

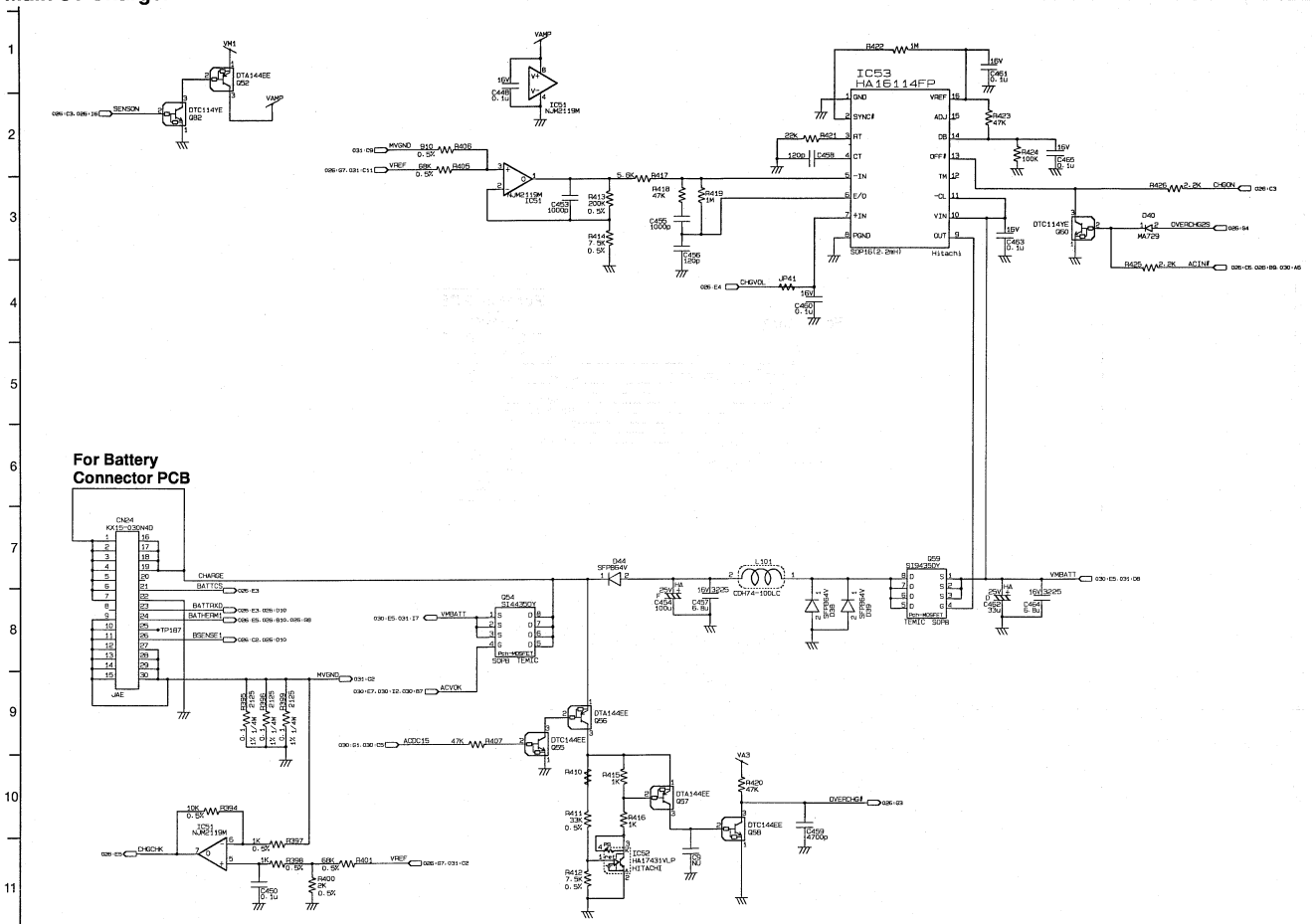
Main 29 VA3, VB5



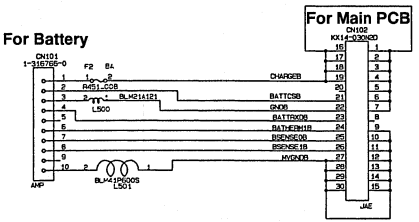
Main 30 DC-IN, VM1



Main 31 Charger

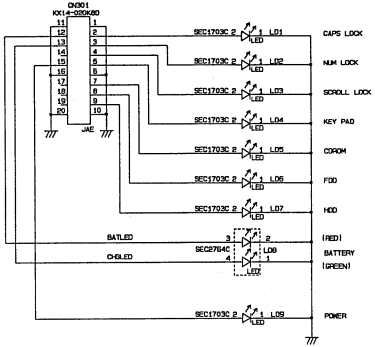


Battery 1 Battery Connector

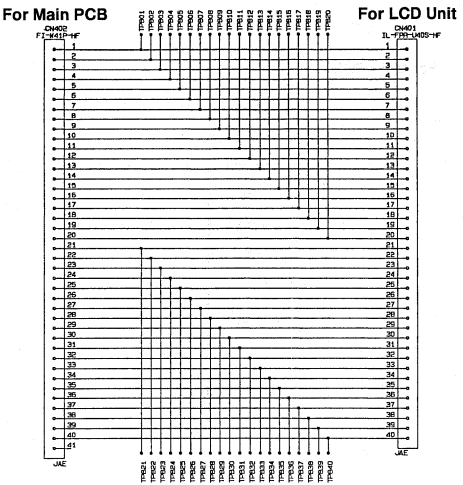


LED 1 LED Connector

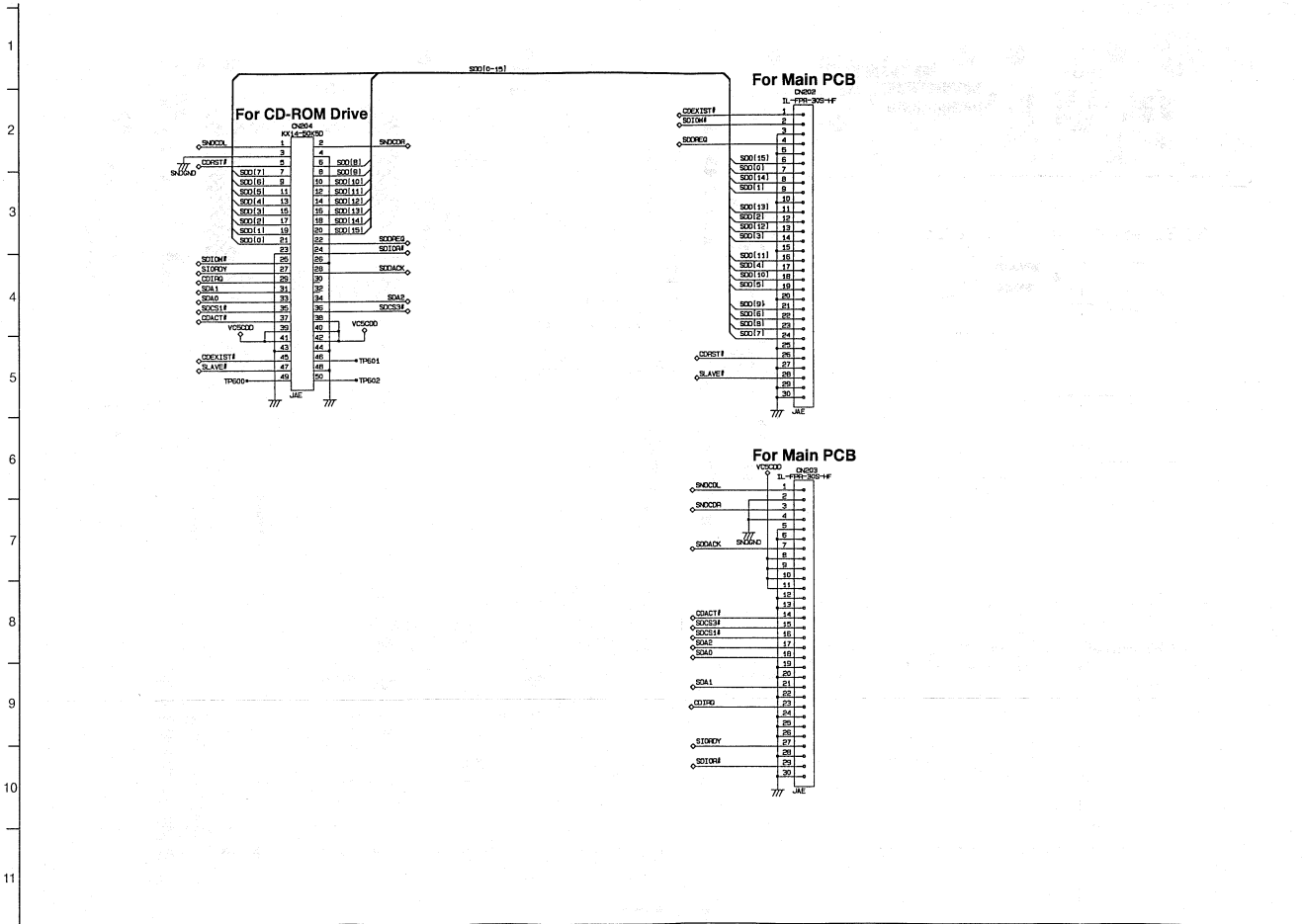
For Main PCB



LCD 1 LCD Connector

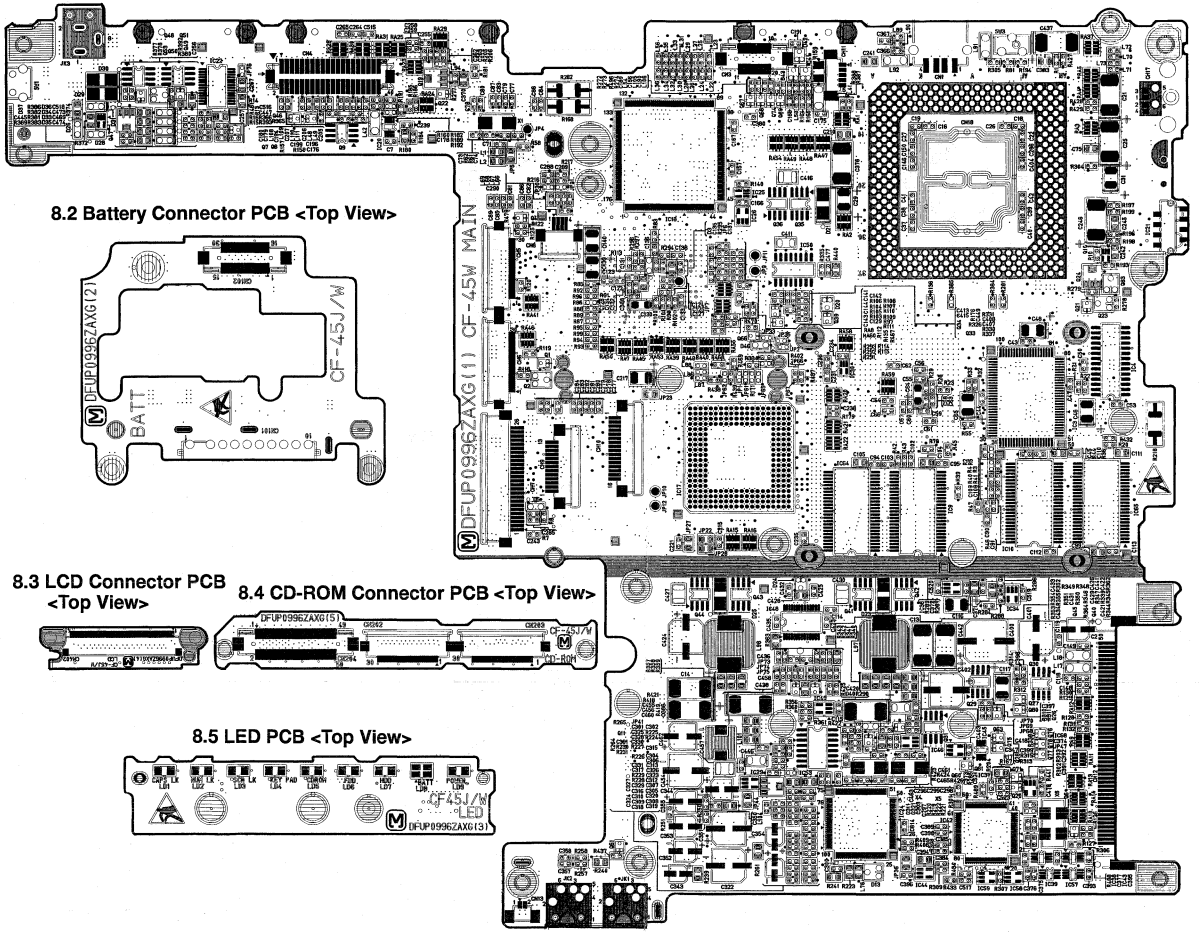


CD-ROM 1 CD-ROM Connector



8. Printed Circuit Board

8.1 Main PCB <Top View>



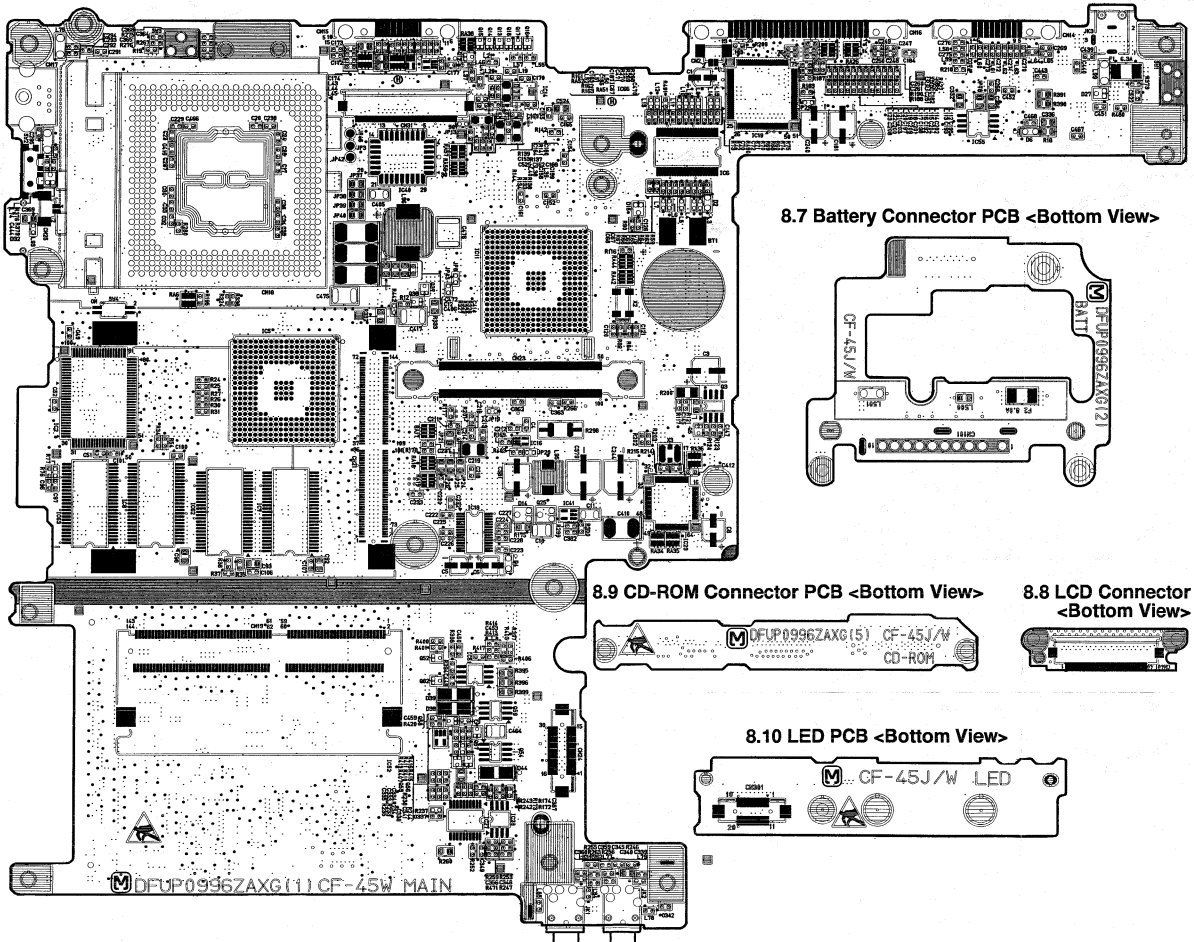
8.2 Battery Connector PCB <Top View>

8.3 LCD Connector PCB <Top View>

8.4 CD-ROM Connector PCB <Top View>

8.5 LED PCB <Top View>

8.6 Main PCB <Bottom View>



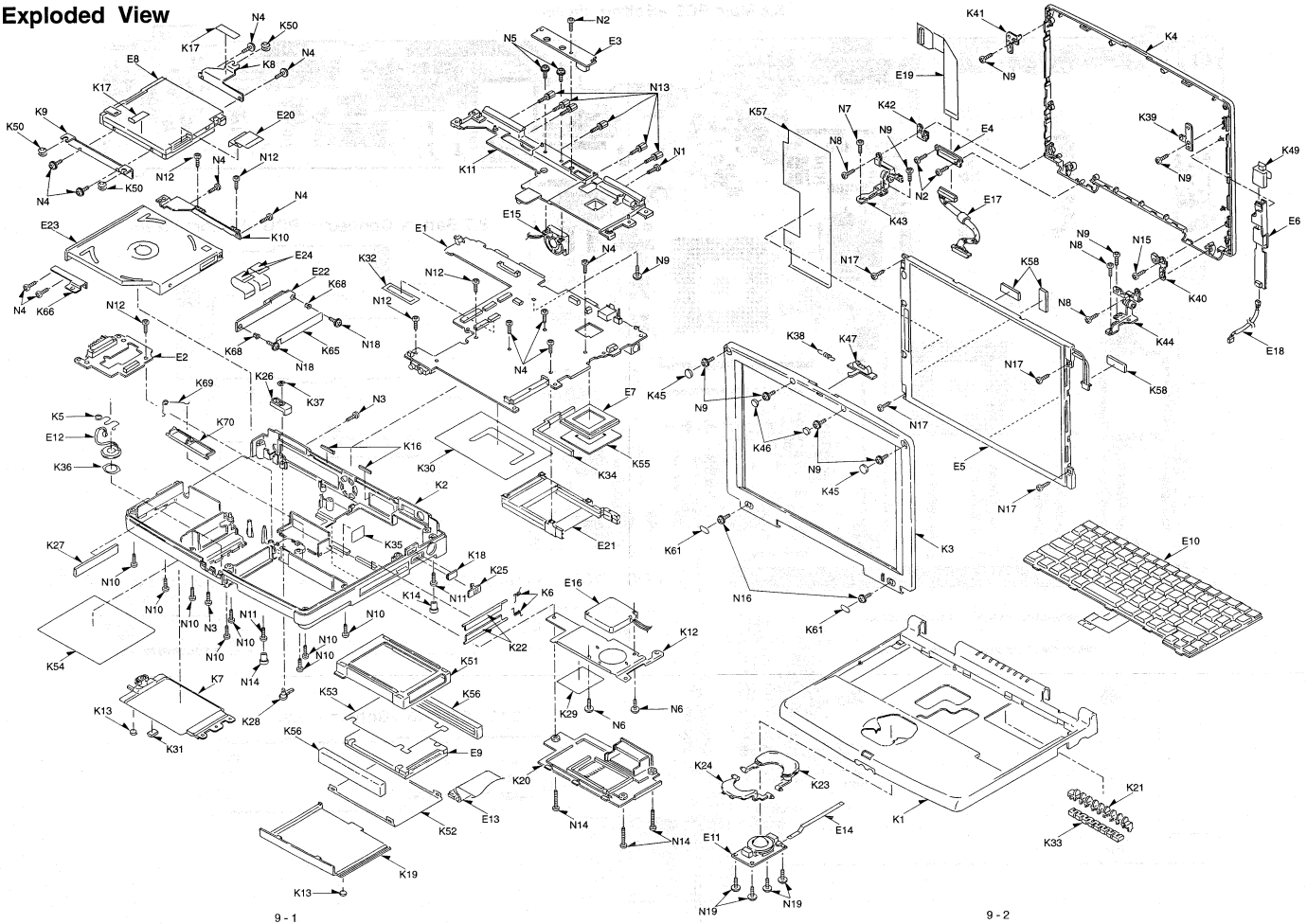
8.7 Battery Connector PCB <Bottom View>

8.9 CD-ROM Connector PCB <Bottom View>

8.8 LCD Connector PCB <Bottom View>

8.10 LED PCB <Bottom View>

9. Exploded View



10. Replacement Parts List

(Main Block Unit, Mechanical Parts, Accessories and Packing Materrial

Note: Important Safety Notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

REF. NO and AREA	PART. NO	DESCRIPTION	Q'TY
Main Block Units			
E1 ⚠	DL3U10996AAA	PCB, MAIN RTL	1
E2	DL3U20996AAA	PCB, BATTERY CONNECTOR RTL	1
E3	DL3U30996AAA	PCB, LED RTL	1
E4	DL3U40996AAA	PCB, LCD CONNECTOR RTL	1
E5	DFAD31SVC6S1	UNIT, LCD	1
E6 ⚠	ECXF6314A	PCB, INVERTER	1
E7	DAV50366200I	CPU (200MHz) (CF-45Mxxxxxx)	1
E7	DAV50366233I	CPU (233MHz) (CF-45Nxxxxxx)	1
E8 ⚠	DFJG066ZA-M	FDD	1
E9 ⚠	DFJH080ZA-F	HDD (2GB) (CF-45xxFxxxx)	1
E9 ⚠	DFJH076ZA-T	HDD (4GB) (CF-45xx4xxxx)	1
E10 (M)	DFSX1A71XATG	KEYBOARD	1
E10 (E)	DFSX1A72XATG	KEYBOARD	1
E10 (G)	DFSX1A73XATG	KEYBOARD	1
E10 (F)	DFSX1A74XATG	KEYBOARD	1
E10 (T)	DFSX1A75XATG	KEYBOARD	1
E10 (S)	DFSX1A76XATG	KEYBOARD	1
E11	IXM0160AA	TRACK BALL	1
E12	DFAS20P02ZAN	SPEAKER	1
E13	DFJS308ZA	CABLE, HDD	1
E14	DFJE04D93DH	FPC, TRACK BALL	1
E15	UDQFB3E01	FAN, (SUB)	1
E16	UDQFC4E91	FAN, CPU	1
E17	DFJS306ZA	CABLE, LCD	1
E18	DFJS307ZA	CABLE, INVERTER	1
E19	DLUP0922A01B	FPC, LCD CONNECTOR	1
E20	DFJE9066ZA	FPC, FDD	1
E21	DFJP128ZA144	PC CARD SLOT	1
E22	DL3U50996AAA	PCB, CD-ROM CONNECTOR RTL	1
E23	DFJD007ZB-T	DRIVE, CD-ROM	1
E24	DFJE30N42BH	FPC, CD-ROM	2
Accessories			
A1 (M)	DFQX2553ZA	MANUAL, USER'S GUIDE	1
A1 (E)	DFQX2553ZAE	MANUAL, USER'S GUIDE	1
A1 (G)	DFQX2554ZA	MANUAL, USER'S GUIDE	1
A1 (F)	DFQX2575ZA	MANUAL, USER'S GUIDE	1
A1 (T)	DFQX2576ZA	MANUAL, USER'S GUIDE	1
A1 (S)	DFQX2577ZA	MANUAL, USER'S GUIDE	1
A2 (M) ⚠	DFJA0047ZAKK	AC CABLE	1
A2 (E) ⚠	DFJA0042ZAKK	AC CABLE	1
A2 (G, F, T, S) ⚠	DFJA0044ZAKK	AC CABLE	1
A3 (M)	DFJN5093ZAZ	FIRST AID CD	1
A3 (E, G, F, T, S)	DFJN5095ZAZ	FIRST AID CD	1
Packing Material			
P1	DFPK0892ZAT	CASE, PACKING (CF-45xxxxxAxx)	1
P1	DFPK0892ZA	CASE, PACKING (CF-45xxxxxJxx)	1
P2	DFPN0649ZAT	CUSHION (CF-45xxxxxAxx)	4
P2	DFPN0649ZA	CUSHION (CF-45xxxxxJxx)	4
Mechanical Parts			
K1	DFWV80C0373	ASS'Y, TOP CABINET	1
K2	DFKF0172XB-0	BOTTOM, CABINET	1

K3		DFKE0403ZA-0	CABINET, LCD FRONT	1
K4		DFKM0235ZA-0	CABINET, LCD REAR	1
K5		DFUN0039ZA	CLAMP, SPRING, SPEAKER	1
K6		DFUW0073ZA	SPRING, PC CARD COVER	2
K7		DFWV64A0030	ASS'Y, BATTERY COVER	1
K8		DFMD7403ZA	PLATE, FDD (L)	1
K9		DFMD7404ZA	PLATE, FDD (R)	1
K10		DFMD7426ZA	PLATE, CD-ROM (L)	1
K11		DFWV61B0002	HEAT SINK, CPU (TOP)	1
K12		DFMY0149ZA	HEAT SINK, CPU	1
K13		DFHG1105ZA-0	RUBBER FOOT	2
K14		DFHG1108ZA-0	RUBBER FOOT, REAR	2
K16		DFHE0145ZA	GASKET (B)	2
K17		DFHE0146ZA	GASKET (C)	2
K18		IPD0201AA	FILTER, IrDA	1
K19		DFKE0405ZA-0	COVER, HDD	1
K20		DFWV80C0378	COVER, HEAT SINK, CPU	1
K21		DFGL0062ZB-0	LENS, LED	1
K22		DFGE0025ZA-0	COVER, PC CARD	2
K23		DFBC0187ZA-0	BUTTON, CLICK (A)	1
K24		DFBC0188ZA-0	BUTTON, CLICK (B)	1
K25		DFBC0189ZB-0	BUTTON, POWER	1
K26		DFBC0190ZA-0	BUTTON, COVER LOCK	1
K27		DFHG764ZA	STOPPER, BATTERY	1
K28		DFBC0193ZA-0	LEVER, COVER LOCK, HDD	1
K29		DFQT6174ZB	LABEL, CAUTION, HIGH TEMPERATURE	1
K30		DFMX0537ZA	SHEET, INSULATION, RAM CARD	1
K31		DFHG763ZA	STOPPER, BATTERY LEVER	1
K32		DFMX0536ZA	SHEET, INSULATION, PORT REPLICATOR	1
K33		DFHR7504ZA	SHEET, LED	1
K34		DFHR7506ZA	DUCT, CPU B	1
K35		DFMX0554ZA	SHEET, INSULATION, EXPANSION BUS	1
K36		DFHR7515ZB	SHEET, SPEAKER	1
K37		XUC3VW	E-RING	1
K38		DFUW0074ZA	SPRING, LCD LOCK	1
K39		DFMD7413ZA	SPACER, LCD (E)	1
K40		DFMD7414ZA	SPACER, LCD (F)	1
K41		DFMD7415ZA	SPACER, LCD (G)	1
K42		DFMD7416ZA	SPACER, LCD (H)	1
K43		DFBH1071ZA	HINGE (L)	1
K44		DFBH1072ZA	HINGE (R)	1
K45		DFHG1104ZB-0	COVER, LCD RUBBER (A)	2
K46		DFHG1127ZA-0	COVER, LCD RUBBER (B)	2
K47		DFBS0038ZB-0	LCD LOCK	1
K49		DFMX0529ZA	SHEET, INSULATION, INVERTER PCB	1
K50		DFHG413ZA	DAMPER, FDD	3
K51		DFKE0410ZA	HOLDER, HDD (A)	1
K52		DFMX0538ZB	HOLDER, HDD (B)	1
K53		DFMX0441WA	SHEET, INSULATION, HDD	1
K54	⚠	DFGT0643ZB	RATING LABEL (CF-45xxxxAxM)	1
K54	⚠	DFGT0663ZA	RATING LABEL (CF-45xxxxJxM)	1
K54	⚠	DFGT0664ZA	RATING LABEL (CF-45xxxxAxE, G, F, T, S)	1
K55		DFHG0152ZA	SHEET, HEAT SINK, CPU	1
K56		DFHG1103ZA	DAMPER, HDD (CF-45xxFxxxx)	2
K56		DFHG1062ZA	DAMPER, HDD (CF-45xx4xxxx)	2
K57		DFMX0530ZB	SHEET, LCD PROTECTION	1
K58		DFMX0531ZAT	SHEET, FPC HOLDER (CF-45xxxxAxM)	3
K58		DFMX0531ZAT	SHEET, FPC HOLDER (CF-45xxxxAxE, G, F, T, S)	1
K58		DFMX0531YA	SHEET, FPC HOLDER (CF-45xxxxJxM)	3
K61		DFGX0188ZAT	SHEET, SCREW BLIND, LCD (CF-45xxxxAxx)	2
K61		DFGX0188ZA	SHEET, SCREW BLIND, LCD (CF-45xxxxJxM)	2
K65		DFMX0542ZB	SHEET, INSULATION, CONNECTOR PCB	1
K66		DFMD7427ZA	PLATE, CD-ROM (R)	1

K68	XRY3X45B	SPACER, CD-ROM	2
K69	DFUW0076ZB	SPRING, EXPANSION BUS COVER	1
K70	DFKE0406ZB-0	COVER, EXPANSION BUS	1
N1	XSB2+4FN	SCREW	1
N2	XSB26+4FN	SCREW	3
N3	XSB26+5FZ	SCREW	2
N4	XYN2+J4FN	SCREW	12
N5	XYN25+C9	SCREW	2
N6	XYN25+J8	SCREW	2
N7	XYN26+C10	SCREW	1
N8	XYN26+C6FZ	SCREW	3
N9	XYN26+J6FN	SCREW	9
N10	XTB26+10GFZ	SCREW	8
N11	XTB26+16GFZ	SCREW	2
N12	XTB26+8GFZ	SCREW	5
N13	DFHE5083ZA	SCREW	6
N14	XSB26+25FZ	SCREW	3
N15	XYN26+C4	SCREW	1
N16	XYN26+J7	SCREW	2
N17	XSB3+5FN	SCREW	4
N18	XYN2+J8	SCREW	2
N19	XYN2+J6	SCREW	4
Main PCB			
BT 1 ⚠	CR2032/1F4	BATTERY	1
C 1 324 327	EEVHA0J220R	CAPACITOR, 6.3V, 22µF	3
C 2	EEVHA1A330R	CAPACITOR, 10V, 33µF	1
C 3 381	EEVHA1C470P	CAPACITOR, 16V, 47µF	2
C 5 6 343	EEVHA1C100R	CAPACITOR, 16V, 10µF	3
C 10	DCUK1C106ZFL	CAPACITOR, 16V, 10µF	1
C 11	DCUE1A106ZFL	CAPACITOR, 10V, 47µF	1
C 12 406 472	DCS0GN227DE	CAPACITOR, 4V, 220µF	3
C 13 420 442	DCS1AP107DE	CAPACITOR, 10V, 100µF	3
C 14 386 436	DCS0JP157DE	CAPACITOR, 6.3V, 150µF	3
C 16 17 18 19 20 22 23 24 26 27 28 30 32 33 34 35 36 37 38 43 44 49 50 53 58 60 61 62 63 66 68 69 71 127 126 128 129 131 133 135 145 146 148 149 150 152 153 154 155 157 161 162 163 164 165 167 169 170 175 178 191 211 212 213 214 215 216 218 220 221 222 223 224 225 226 227 228 229 230 239 243 268 285 286 287 290 295 300 303 307 313 314 323 326 333 334 335 337 339 341 349 350 351 361 362 364 377 380 387 389 390 393 403 404 414 415 419 425 432 439 440 441 443 446 448 450 451 452 460 461 463 465 466 470 477 478	ECUV1E104ZFV	CAPACITOR, 25V, 0.1µF	136
C 21 25 378 437	ECST1AD107R	CAPACITOR, 10V, 100µF	4
C 46 65 116 139	ECST1AX226R	CAPACITOR, 10V, 22µF	4
C 64 158 159 160 525	ECST1AY106R	CAPACITOR, 10V, 10µF	5
C 73 74	ECUV1H080DCV	CAPACITOR, 50V, 8pF	2
C 75 92 98 104 110 132 210 241 242 245 256 257 266 267 301 302 340 347 369 370 371 372 373 383 394 428 524	ECUV1C105ZFX	CAPACITOR, 16V, 1µF	27
C 81 85 89 298 299	ECUV1H100DCV	CAPACITOR, 50V, 10pF	5
C 94 100 106 112 124 125 172 173 174 310 320 397 398 399 445	ECUV1H103KBV	CAPACITOR, 50V, 0.01µF	15
C 120 121	ECUV1H150JCV	CAPACITOR, 50V, 15pF	2

C 122 123 176 233 234 235 236 237 238 277 278 279 280 281 282 283 284 308 309 311 312 318 319 321 329 330 331 357 365 368 374 375 376 382 388 412 413 429 447 453 455	ECUV1H102JCV	CAPACITOR, 50V, 1000pF	41
C 141 142 143 144 179 288 289 291 292 293 294	ECUV1H470JCV	CAPACITOR, 50V, 47pF	11
C 177 180	ECUV1H390JCV	CAPACITOR, 50V, 39pF	2
C 181 240	EEVHA0J101P	CAPACITOR, 6.3V, 100µF	2
C 182 184	ECUV1H151JCV	CAPACITOR, 50V, 150pF	2
C 183 185 187	ECUV1H330JCV	CAPACITOR, 50V, 33pF	3
C 186 188 189 190 247 248 249 250 251 252 253 254 255 258 259 260 261 264 265	ECUV1H221JCV	CAPACITOR, 50V, 220pF	19
C 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 426	ECUV1H680JCV	CAPACITOR, 50V, 68pF	19
C 217 219	ECST1CX106R	CAPACITOR, 16V, 10µF	2
C 244 322 354 379	EEVHA1A101P	CAPACITOR, 10V, 100µF	4
C 246	ECST1CD476R	CAPACITOR, 16V, 47µF	1
C 262 263	ECUV1H681JCV	CAPACITOR, 50V, 680pF	2
C 269 270 271 272 273 274 275 276 342 345 359 360 423 435 467 517	ECUV1H101JCV	CAPACITOR, 50V, 100pF	16
C 296 297	ECUV1H030CCV	CAPACITOR, 50V, 3pF	2
C 304 305 306 315 316 317 325 328 338 348 358 396	ECUV1C224ZFV	CAPACITOR, 16V, 0.22µF	12
C 344 352 353	EEVHA0J470R	CAPACITOR, 6.3V, 47µF	3
C 356 384 385 459	ECUV1H472KBV	CAPACITOR, 50V, 4700pF	4
C 391 392	ECUV1H120JCV	CAPACITOR, 50V, 12pF	2
C 400	EEVHA1C331P	CAPACITOR, 16V, 330µF	1
C 401 402 424 454	EEVHA1E101P	CAPACITOR, 25V, 100µF	4
C 405 418 438	DCUE1C475ZFL	CAPACITOR, 16V, 4.7µF	3
C 410	ECST1CV476R	CAPACITOR, 16V, 47µF	1
C 411	ICUV1C105KBX	CAPACITOR, 16V, 1µF	1
C 416 427 430 457 464	DCUK1C685ZFL	CAPACITOR, 16V, 6.8µF	5
C 417 475	DCU01C106MBD	CAPACITOR, 16V, 10µF	2
C 422 433	ECUV1H473ZFV	CAPACITOR, 50V, 0.047µF	2
C 431	ECUV1H152KBV	CAPACITOR, 50V, 1500pF	1
C 456 458	ECUV1H121JCV	CAPACITOR, 50V, 120pF	2
C 462	EEVHA1E330P	CAPACITOR, 16V, 33µF	1
C 476	5650B1C226MT	CAPACITOR, 16V, 22µF	1
CN 1	DFJS309ZA004	CONNECTOR, USB PORT	1
CN 2	DFJS310ZA002	CONNECTOR, FOR FAN	1
CN 3	DFJP130ZA020	CONNECTOR, FOR LED PCB	1
CN 4	DFJP112ZA040	CONNECTOR, FOR LCD CONNECTOR PCB	1
CN 5	DFJS120ZA030	CONNECTOR, FOR CD-ROM DRIVE	1
CN 6	DFJS120ZA030	CONNECTOR, FOR CD-ROM DRIVE	1
CN 7	DFJS311ZA026	CONNECTOR, FOR FDD	1
CN 8	DFJS311ZA004	CONNECTOR, FOR TRACK BALL	1
CN 9	DFJS311ZA013	CONNECTOR, FOR KEYBOARD	1
CN 10	DFJS311ZA016	CONNECTOR, FOR KEYBOARD	1
CN 11	DFJS310ZA005	CONNECTOR, FOR INVERTER PCB	1
CN 12	DFJP50C96ZA	CONNECTOR, FOR HDD	1
CN 13	DFJS310ZA002	CONNECTOR, FOR SPEAKER	1
CN 14	DFJP126ZA009	CONNECTOR, SERIAL PORT	1
CN 15	DFJS297ZA015	CONNECTOR, VGA PORT	1
CN 16	DFJS296ZA025	CONNECTOR, PARALLEL PORT	1
CN 17	DFJS313ZA006	CONNECTOR, EXT. KEYBOARD/MOUSE PORT	1
CN 18	DFJS324ZA333	CONNECTOR, FOR CPU	1
CN 19	DFJP127ZA144	CONNECTOR, FOR RAM CARD	1
CN 21	DFJP129ZA144	CONNECTOR, FOR PC CARD SLOT	1
CN 23	DFJP109ZA100	CONNECTOR, FOR PORT REPLICATOR	1

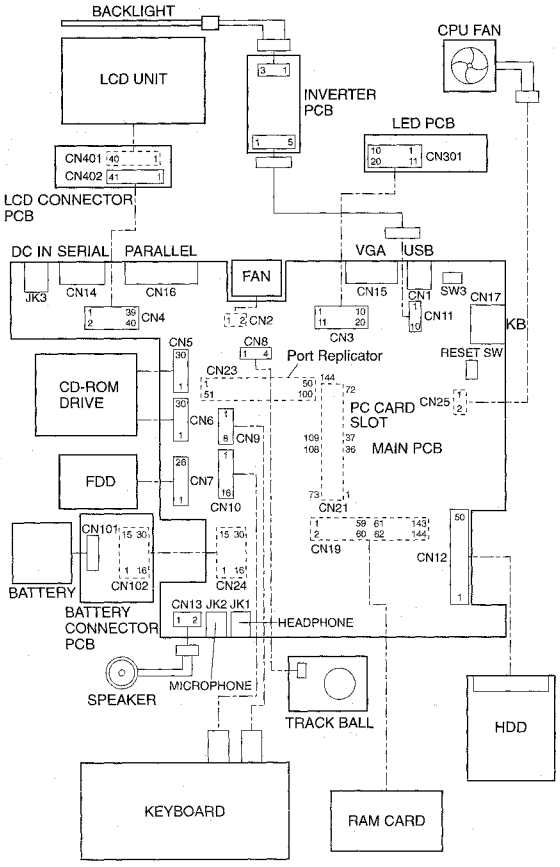
CN 24	DFJP131ZA030	CONNECTOR, FOR BATTERY CONNECTOR PCB	1
CN 25	DFJS310ZA002	CONNECTOR, FOR CPU FAN	1
CN 31	DFJS120ZA050	CONNECTOR, FOR ROM-WRITER	1
D 2 3 4 5 28 40 46	MA729-TX	DIODE	7
D 6 34	DEDUDZ6R2BT	DIODE	2
D 14	DEDRB400DT97	DIODE	1
D 15 27	DEDRB715FT7	DIODE	2
D 20 24	DEDAP202UT7	DIODE	2
D 21 23 25 38 39 44	DEDSFPB64V	DIODE	6
D 26	DEDUDZ9R1BT	DIODE	1
D 29 30	DEDRB081L20	DIODE	2
D 33	DEDUDZ15BT	DIODE	1
D 35	DEDUDZ5R1BT	DIODE	1
D 36	DEDUDZ4R7BT	DIODE	1
D 37	DED03P2JT1-D	DIODE	1
D 41 42 43	DEDDA204UT	DIODE	3
F 1	XBAD4516R30L	FUSE (6.3A)	1
IC 2	IS61C632A7TQ	IC, L2 CACHE	1
IC 3	IS61C632A7TQ	IC, L2 CACHE	1
IC 4	DA1256J15X2P	IC, TAG RAM	1
IC 5	DAFW82439TXI	IC, MTXC	1
IC 6	IMIXG571CYB	IC, CLOCK	1
IC 7	DAS65165A6D	IC, DRAM	1
IC 8	DAS65165A6D	IC, DRAM	1
IC 9	DAS65165A6D	IC, DRAM	1
IC 10	DAS65165A6D	IC, DRAM	1
IC 11	DAFW82371EBI	IC, PIIX4E	1
IC 13	DANM2160BX2Z	IC, VGA CONTROLLER	1
IC 14	XC62FP3302PR	IC, REGULATOR	1
IC 17	DAI1250AGFNT	IC, PCMCIA CONTROLLER	1
IC 18	DAS2206IDBLT	IC, PCMCIA POWER	1
IC 19	DA97338VJG-N	IC, SUPER I/O	1
IC 21	TFDS6500	IC, IrDA	1
IC 22	DA221CAT-XJ	IC, SERIAL DRIVER	1
IC 23	DA38802E400M	IC, KBC	1
IC 24	DAYMF715ES-Y	IC, SOUND	1
IC 26	DA7S32FT85L0	IC, OR GATE	1
IC 27	DA7787FSE2E	IC, REGULATOR	1
IC 28	DAM2904MT1-P	IC, POWER AMP	1
IC 29	DALP298050N	IC, REGULATOR	1
IC 34	DAPST9140NXT	IC, RESET	1
IC 36	DAPST9125NXT	IC, RESET	1
IC 37	DAPST9125NXT	IC, RESET	1
IC 38	DA7W14UT12L0	IC, INVERTER	1
IC 39	DA7W14UT12L0	IC, INVERTER	1
IC 40	DA493V02GXIN	IC, BIOS	1
IC 41	DA8327E50MCW	IC, UP CONVERTER	1
IC 42	DA38867E401M	IC, PMC	1
IC 43	DA7W74UT12L0	IC, FLIP-FLOP	1
IC 44	DALP298030N	IC, REGULATOR	1
IC 45	DA7W02UT12L0	IC, NOR GATE	1
IC 46	DA7S14FT85L0	IC, INVERTER	1
IC 48	DA3020PT-X2X	IC, STEP-UP REGULATOR	1
IC 49	DAPST9125NXT	IC, RESET SWITCH	1
IC 50	SB3030P	IC, STEP-UP REGULATOR	1
IC 51	DAM2119MT1-P	IC, POWER AMP	1
IC 52	DA17431VLELH	IC, REGULATOR	1
IC 53	DA16114FPTH	IC, CHARGER CONTROLLER	1
IC 55	MB3761PF-EF	IC, REGULATOR	1
IC 57	DA7W74UT12L0	IC, FLIP-FLOP	1
IC 58	DA7S02FT85L0	IC, NOR GATE	1
IC 59	DA7S02FT85L0	IC, NOR GATE	1
IC 66	DA7ST08U85L0	IC, AND GATE	1

IC 67	DA7ST08U85L0	IC, AND GATE	1
IC 68	DA7S32FT85L0	IC, OR GATE	1
JK 1	DFJJD6S10ZAG	JK, HEADPHONE	1
JK 2	DFJJD6S10ZAG	JK, MICROPHONE	1
JK 3	DFJJB3Z07ZAH	JK, DC-IN	1
L 1 104	DDB5Z005-L	FERRITE BEAD	2
L 17 18 41 42 74 75 91 92 99	DDB5Z028C-L	FERRITE BEAD	9
L 19 20 21 22 23 24 26 26 27 28 29 30 31 32 33 34 35 36 37	ERJ3GEYJ510V	FERRITE BEAD	19
L 38 39 40 43 44 45 66 67 68 69 70 71 72 73 89 90	DDB5Z024E-L	FERRITE BEAD	16
L 46 47 50 51 52 53 54 55 57 105 106	DDB5Z034B-Y	FERRITE BEAD	11
L 48 49 58 59 60 61 62 63 64 65 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123	DDB5Z021G-Y	FERRITE BEAD	26
L 77 78 79 83 84 85	DDB5Z021C-Y	FERRITE BEAD	6
L 95	DDAZS101LTZ3	FERRITE BEAD	1
L 96	DDAZS6R1NTZ4	FERRITE BEAD	1
L 97	DDAZS150MTZ4	FERRITE BEAD	1
L 98	DDAZS120MTZ2	FERRITE BEAD	1
L 101	DDAZS100LTZ3	FERRITE BEAD	1
Q 1 4 5 6 7 20 21 22 26 60 63 66 75 76 77 78 80 81 82	DETC114YETL	TRANSISTOR	19
Q 2 50	2SK1582T2	TRANSISTOR	2
Q 3 29 51 54	DASI4435DYT1	TRANSISTOR	4
Q 8 27 28 39 49 52 53 56 57 71	DETA144EETL	TRANSISTOR	10
Q 9 30 31	DASI4410DYT1	TRANSISTOR	3
Q 10	DETUMC2NTR	TRANSISTOR	1
Q 11	2SJ187TD	TRANSISTOR	1
Q 12 13 14 15 16 17 18 67 68 69	DETA114EETL	TRANSISTOR	10
Q 19 24	2SJ197-T1	TRANSISTOR	2
Q 23 25 83	DANDS351AN	TRANSISTOR	3
Q 35	DASI4420DYT1	TRANSISTOR	1
Q 36	DAFDS6612A	TRANSISTOR	1
Q 37 38 46 55 58 61	DETC144EETL	TRANSISTOR	6
Q 41 42 43 44	DASI4412DYT1	TRANSISTOR	4
Q 47	DETUMG2NTR	TRANSISTOR	1
Q 48 59	DASI9435DYT2	TRANSISTOR	2
R 1 55 59 85 88 89 118 122 126 133 138 160 172 173 174 187 188 194 195 216 217 253 288 293 294 295 296 297 324 338 384 433 434 437 470 487	ERJ3GEYJ103V	RESISTOR, 1/16W, 10KΩ	36
R 8 19 22 58 97 101 102 184 197 201 244 259 277 278 279 301 307 352 377 378 424	ERJ3GEYJ104V	RESISTOR, 1/16W, 100KΩ	21
R 13	ERA3YKD1333V	RESISTOR, 1/16W, 133KΩ	1
R 14 15 394	ERA3YED103V	RESISTOR, 1/16W, 10KΩ	3
R 16 345 354	ERA3YKD104V	RESISTOR, 1/16W, 100KΩ	3
R 17 112 113 114 115 177 190 196 210 250 251 265 366 407 418 420 423 441 488 489	ERJ3GEYJ473V	RESISTOR, 1/16W, 47KΩ	20
R 18 380 381 382 383 386	ERJ6GEYJ101V	RESISTOR, 1/10W 100Ω	6
R 23 25 26 28 31 32 54 81 116 193 209 230 231 264 305 306	ERJ3GEYJ472V	RESISTOR, 1/16W, 4.7K Ω	16
R 35 36 37 38 39 40 41 42 43 44 45 46 47 61 128 139 215 220 222 284 467	ERJ3GEY0R00V	RESISTOR, 1/16W, 0Ω	21
R 60 90 91 99 119 131 185 186 281 291 292 304 415 416	ERJ3GEYJ102V	RESISTOR, 1/16W, 1KΩ	14
R 62 123 124 157 158 219 221 302 310 311 312 313 314 315 419 422	ERJ3GEYJ105V	RESISTOR, 1/16W, 1MΩ	16
R 63 64 65 66 67 68 69 70 71 72 73	ERJ3GEYJ390V	RESISTOR, 1/16W, 39 Ω	13

74 75			
R 82	ERJ3GEYJ106V	RESISTOR, 1/16W, 10M Ω	1
R 83 134 167 169 181 205 206 267 289 290	ERJ3GEYJ101V	RESISTOR, 1/16W, 100 Ω	10
R 84	ERJ3GEYJ154V	RESISTOR, 1/16W, 150K Ω	1
R 103 104 105 106	ERJ3GEYJ270V	RESISTOR, 1/16W, 27 Ω	4
R 107 108 109 110 257 258	ERJ3GEYJ153V	RESISTOR, 1/16W, 15K Ω	6
R 120 132 365 373 417	ERJ3GEYJ562V	RESISTOR, 1/16W, 5.6K Ω	5
R 127 129 130 182 183 376 490 491	ERJ3GEYJ330V	RESISTOR, 1/16W, 33 Ω	8
R 137	ERA3YED113V	RESISTOR, 1/16W, 11K Ω	1
R 159	DBUPPRR100TW	POLY SWITCH (1A)	1
R 161 162 163	ERJ6ENF75R0V	RESISTOR, 1/10W, 75 Ω	3
R 164 165 191 228 229 242 246 247 393 425 426	ERJ3GEYJ222V	RESISTOR, 1/16W, 2.2K Ω	11
R 168 218 282	DBTMNSMD100	POLY SWITCH (1A)	3
R 175	ERJ6GEYJ1R0V	RESISTOR, 1/10W, 1 Ω	1
R 178 179	ERJ3GEYJ393V	RESISTOR, 1/16W, 39K Ω	2
R 180	ERJ6GEYJ120V	RESISTOR, 1/10W, 12 Ω	1
R 198	ERJ3GEYJ3R3V	RESISTOR, 1/16W, 3.3 Ω	1
R 199	ERJ3GEYJ510V	RESISTOR, 1/16W, 51 Ω	1
R 200	DBUPPR0042TW	POLY SWITCH (2A)	1
R 223 238 332 333 362 363 364	ERJ6GEY0R00V	RESISTOR, 1/10W, 0 Ω	7
R 224 225 226 227 421	ERJ3GEYJ223V	RESISTOR, 1/16W, 22K Ω	5
R 233 234 235	ERJ3GEYJ333V	RESISTOR, 1/16W, 33K Ω	3
R 243	ERJ3GEYJ272V	RESISTOR, 1/16W, 2.7K Ω	1
R 252 337	ERJ3GEYJ394V	RESISTOR, 1/16W, 390K Ω	2
R 255 256	ERJ3GEYJ221V	RESISTOR, 1/16W, 220 Ω	2
R 265 471	ERJ3GEYJ471V	RESISTOR, 1/16W, 470 Ω	2
R 266 286 287 347 379 392	ERJ3GEYJ474V	RESISTOR, 1/16W, 470K Ω	6
R 268 270	ERJ3GEYJ331V	RESISTOR, 1/16W, 330 Ω	2
R 269 273 274	ERJ3GEYJ151V	RESISTOR, 1/16W, 150 Ω	3
R 272	ERJ3GEYJ621V	RESISTOR, 1/16W, 620 Ω	1
R 275 351 361	ERJ3GEYJ224V	RESISTOR, 1/16W, 220K Ω	3
R 276 360	ERJ3GEYJ274V	RESISTOR, 1/16W, 270K Ω	2
R 280	DBT10KC1513P	THERMISTER	1
R 298	DBTMNSMD075	POLY SWITCH (0.75A)	1
R 299	ERA3YKD563V	RESISTOR, 1/16W, 56K Ω	1
R 300 353	ERA3YKD393V	RESISTOR, 1/16W, 39K Ω	2
R 303	ERJ3GEYJ202V	RESISTOR, 1/16W, 2K Ω	1
R 308	ERA3YED392V	RESISTOR, 1/16W, 3.9K Ω	1
R 309 412 414	ERA3YED752V	RESISTOR, 1/16W, 7.5K Ω	3
R 327 328 342 343 357 358	DBJ14RR047VM	RESISTOR, 1/4W, 47 Ω	6
R 329	DBJ14RR022VM	RESISTOR, 1/4W, 22 Ω	1
R 330	ERA3YED273V	RESISTOR, 1/16W, 27K Ω	1
R 331	ERA3YED203V	RESISTOR, 1/16W, 20K Ω	1
R 335	ERJ3GEYJ824V	RESISTOR, 1/16W, 820K Ω	1
R 341 359 395 396 399	DBJ8GF0R10VM	RESISTOR, 1/4W, 0.1 Ω	5
R 344	ERA3YKD114V	RESISTOR, 1/16W, 110K Ω	1
R 346	ERJ3GEYJ825V	RESISTOR, 1/16W, 8.2M Ω	1
R 348 349	ERJ3GEYJ335V	RESISTOR, 1/16W, 3.3M Ω	2
R 350	ERJ3GEYJ685V	RESISTOR, 1/16W, 6.8M Ω	1
R 389	ERJ3GEYJ273V	RESISTOR, 1/16W, 27K Ω	1
R 390 391	ERJ6GEYJ222V	RESISTOR, 1/16W, 2.2K Ω	2
R 397 398	ERA3YED102V	RESISTOR, 1/16W, 1K Ω	2
R 400	ERA3YED202V	RESISTOR, 1/16W, 2K Ω	1
R 401 405	ERA3YKD683V	RESISTOR, 1/16W, 68K Ω	2
R 406	ERA3YED911V	RESISTOR, 1/16W, 910 Ω	1
R 411	ERA3YED333V	RESISTOR, 1/16W, 33K Ω	1
R 413	ERA3YKD204V	RESISTOR, 1/16W, 200K Ω	1
R 440	ERJ6GEYJ3R3V	RESISTOR, 1/16W, 3.3 Ω	1

R 480	ERA3YKD304V	RESISTOR, 1/16W, 4.7K Ω	1
RA 1 2 3 4 5 6 28 29	DEAYC164J472	RESISTOR ARRAY, 300KΩ	8
RA 7 8	DEAYC164J104	RESISTOR ARRAY, 100KΩ	2
RA 9 10 11 12 13 14 36	DEAYC164J330	RESISTOR ARRAY, 33Ω	7
RA 15 16 17 18 19 20 21 22	DEAYC164J393	RESISTOR ARRAY, 39KΩ	8
RA 23	DEAYC164J473	RESISTOR ARRAY, 47KΩ	1
RA 24 30 31	DEAYC164J102	RESISTOR ARRAY, 1KΩ	3
RA 25 26 27	DEAYC164J220	RESISTOR ARRAY, 22Ω	3
RA 34 35 37 39 40 41 42 43 44 47 48 49 50 51 52 53 54 55 56 57 58 59 60	DEAYC164J103	RESISTOR ARRAY, 10KΩ	23
RA 38	DEAYC164J151	RESISTOR ARRAY, 150Ω	1
RA 45 46	DEAYC164J562	RESISTOR ARRAY, 5.6KΩ	2
SW 1	EVQPF004R	SW, RESET	1
SW 2	ESD165236	SW, POWER	1
SW 3	DFSX1A35ZAXD	SW, LCD-CLOSE	1
SW 4	DFSS2B14ZAXN	SW, CPU FREQ.	1
X 1	IEV0399AA-K	OSCILLATOR (14.318MHz)	1
X 2	DECU00032M1D	OSCILLATOR (32.768KHz)	1
X 3	DEBI8R00N1LX	OSCILLATOR (8MHz)	1
X 4	IEV0402AA-K	OSCILLATOR (33.8688MHz)	1
X 5	IEV0401AA-K	OSCILLATOR (24.476MHz)	1
X 6	DECU04000K1H	OSCILLATOR (4MHz)	1
BATTERY CONNECTOR PCB			
CN 101	DFJP084ZA010	CONNECTOR, FOR BATTERY	1
CN 102	DFJS305ZA030	CONNECTOR, FOR MAIN PCB	1
F 2	XBAD4518R00L	FUSE (8.0A)	1
L 500	DDB5Z005-L	FERRITE BEAD	1
L 501	DDB5Z028C-L	FERRITE BEAD	1
LED PCB			
CN 301	DFJS018ZA020	CONNECTOR, FOR MAIN PCB	1
LD 1 2 3 4 5 6 7 9	SEC1703C	L.E.D.	8
LD 8	SEC2764C	L.E.D.	1
LCD CONNECTOR PCB			
CN 401	DFJS120ZA040	CONNECTOR, FOR MAIN PCB	1
CN 402	DFJP101ZA041	CONNECTOR, FOR LCD UNIT	1
CD-ROM CONNECTOR PCB			
CN 202	DFJS317ZA030	CONNECTOR, FOR MAIN PCB	1
CN 203	DFJS317ZA030	CONNECTOR, FOR MAIN PCB	1
CN 204	DFJS315ZA050	CONNECTOR, FOR CD-ROM	1

11. Wiring Connection Diagram



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Service Manual

Notebook Computer

CF-45

Supplement-13

TOUGHBOOK 45

Please file and use this manual together with the following Service Manuals.
CF-45 Service Manual (Order No. CPD9806032C0) for original CF-45 models.
CF-45 Simplified Service Manual
(CPD9810044A0)/(CPD9901003A0)/(CPD9905022A0)/(CPD9906029A0)
(CPD9909082A0)/(CPD0002027A1)
CF-45 Supplement Service Manual
-1 (CPD9807034S0)/-2 (CPD9808040S0)/-3 (CPD9810051S0)
-4 (CPD9811053S0)/-5 (CPD9811054S0)/-6 (CPD9903017S0)
-7 (CPD9903018S0)/-8 (CPD9905021S0)/-9 (CPD9906033S0)
-10 (CPD9907044S0)/-11(CPD0004044S0)/-12(CPD000405881)

This is the Service Manual for the following areas.

M ...for U.S.A. and Canada
E ...for U.K.
G ...for Germany
F ...for France
S ...for Sweden
T ...for Italy

Applied Model

CF-45 All series

Parts Comparison Table

(CF-45MJx8xxx, CF-45NJx8xxx, CF-45RJ48xAx)

REF. NO. and AREA	PART NO.		DESCRIPTION	Q'TY
	ORIGINAL	NEW		
Mechanical Parts				
K95	———	**DFWV99A0043**	HDD Mounting Kit for Support	(1)
K51	DFKE0410ZA		HOLDER, HDD (A)	1
K52	DFMX0538ZB		HOLDER, HDD (B)	1
K53	DFMX0441WA		SHEET, INSULATION, HDD	1
Main Block Unit				
E9-2	DFHG1103ZA		DAMPER, HDD	2
E9-3	DFHR7544ZA		SPACER, HDD	1
E13	DFJS308ZA		CABLE, HDD	1

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Parts Comparison Table

(CF-45KJ6GJEM)

REF. NO. and AREA	PART NO. ORIGINAL	PART NO. NEW	DESCRIPTION	Q'TY
Mechanical Parts				
K95	———	**DFWV99A0044**	HDD Mounting Kit for Support	(1)
K51	DFKE0410ZA		HOLDER, HDD (A)	1
K52	DFMX0538ZB		HOLDER, HDD (B)	1
K53	DFMX0441WA		SHEET, INSULATION, HDD	1
K56	DFHG1103ZA		DAMPER, HDD	2
Main Block Unit				
E13	DFJS308ZA		CABLE, HDD	1

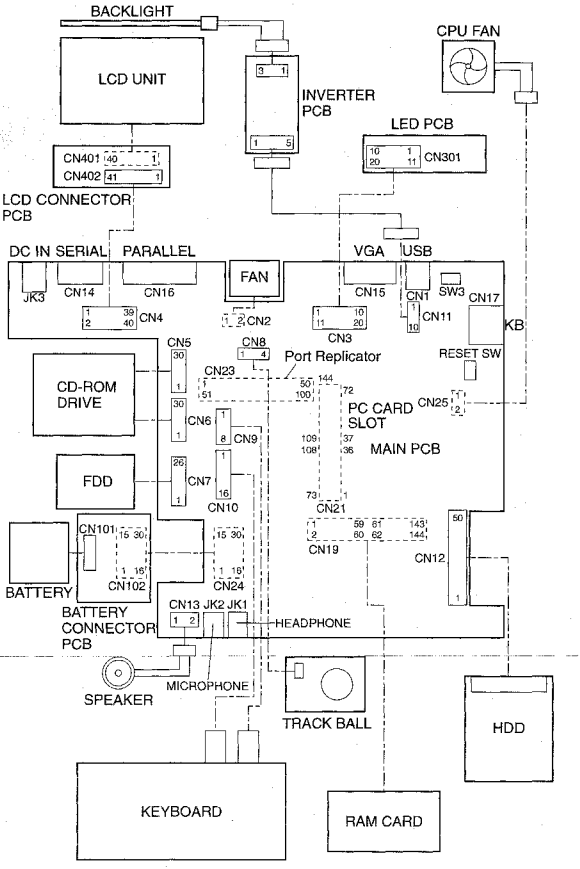
(CF-45DJ48AAx)

REF. NO. and AREA	PART NO. ORIGINAL	PART NO. NEW	DESCRIPTION	Q'TY
Mechanical Parts				
K95	———	**DFWV99A0045**	HDD Mounting Kit for Support	(1)
K51	DFKE0410ZA		HOLDER, HDD (A)	1
K52	DFMX0538ZAT		HOLDER, HDD (B)	1
K53	DFMX0532ZA		SHEET, INSULATION, HDD	1
K56	DFHG1062ZA		DAMPER, HDD	2
K75	DFHR7544ZA		SPACER, HDD	1
Main Block Unit				
E13	DFJS308ZA		CABLE, HDD	1

(CF-45DJ48JAM)

REF. NO. and AREA	PART NO. ORIGINAL	PART NO. NEW	DESCRIPTION	Q'TY
Mechanical Parts				
K95	———	**DFWV99A0046**	HDD Mounting Kit for Support	(1)
K51	DFKE0410ZA		HOLDER, HDD (A)	1
K52	DFMX0538ZB		HOLDER, HDD (B)	1
K53	DFMX0441WA		SHEET, INSULATION, HDD	1
K56	DFHG1062ZA		DAMPER, HDD	2
K75	DFHR7544ZA		SPACER, HDD	1
Main Block Unit				
E13	DFJS308ZA		CABLE, HDD	1

11. Wiring Connection Diagram



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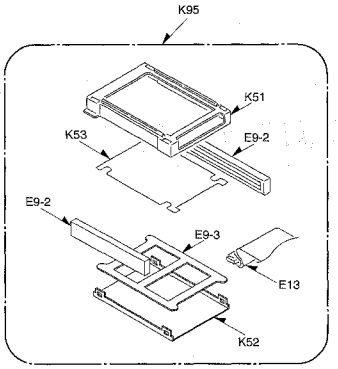
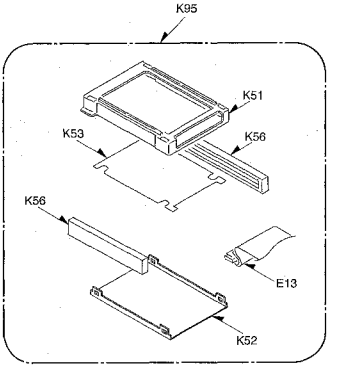
Exploded View

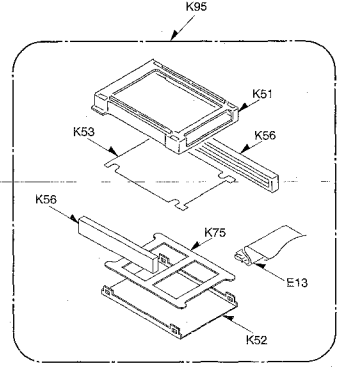
(Only CF-45MJx8xxx, CF-45NJx8xxx and CF-45RJ48xAx.)



(Only CF-45KJ6GJEM.)



(Only CF-45DJ48AAx and CF-45DJ48JAM.)



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G22

Service Manual

Supplement-1

Notebook Computer

CF-45

TOUGHBOOK 45

Please file and use this manual together with the following Service Manuals.
CF-45 Service Manual (Order No. CPD9806032C0) for original CF-45 models.

This is the Service Manual for the following areas.

- [M] ... for U.S.A. and Canada
- [E] ... for U.K.
- [G] ... for Germany
- [F] ... for France
- [S] ... for Sweden
- [T] ... for Italy

Correction

Applied Model

CF-45xxxxAxx, CF-45xxxxJxM

Parts Comparison Table

Refer to page 10-1 of Replacement Parts List (Order No. CPD9806032CO)

REF. NO. and AREA	PART NO.		DESCRIPTION	Q'TY
	INCORRECT	CORRECT		
Mechanical Parts				
K1	DFWV80C0379	**DFWV80C0373**	ASS'Y, TOP CABINET	1

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Service Manual

Notebook Computer

CF-45

TOUGHBOOK 45

Supplement-2

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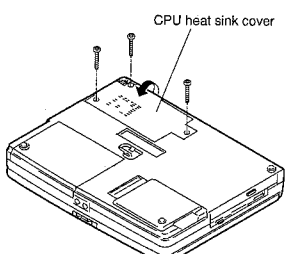
CF-45 Service Manual (Order No. CPD9806032C0) for original CF-45 models.
CF-45 Supplement-1 Service Manual (Order No. CPD9807034S0)

This is the Service Manual for the following areas.

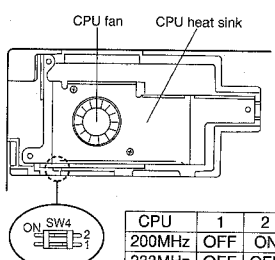
- M ... for U.S.A. and Canada
- E ... for U.K.
- G ... for Germany
- F ... for France
- S ... for Sweden
- T ... for Italy

SW4 setting for CPU speed type

1. Remove the three screws.
   Remove the CPU heat sink cover.



2. Set the SW4.



CPU	1	2
200MHz	OFF	ON
233MHz	OFF	OFF

* Set SW4 as shown above according to the speed of the CPU mounted.

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6. Disassembly/Reassembly

Note: Power off the computer. Do not shut down to the Suspend or Hibernation mode.
Do not add peripherals while the computer is in the Suspend or Hibernation mode; abnormal operation may result.

6.14 Removing the Backlight.

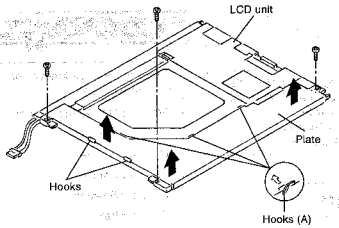

Figure 34

1. Remove the three screws.
2. Bend the hooks (A) at the three locations with a pliers toward outer side.
3. Remove the plate in the direction of arrow.

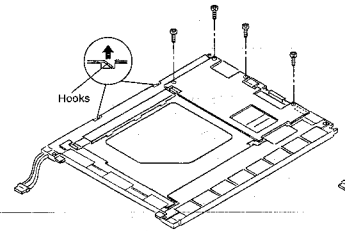

Figure 35

4. Remove the four screws.
5. Bend the hooks at two locations with a pliers toward outer side.

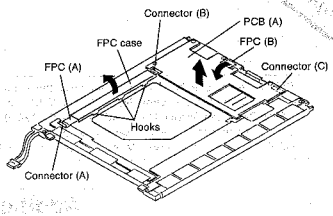

Figure 36

6. Open the FPC case.
   Disconnect the FPC (A) from connectors (A), (B).
7. Disconnect the FPC (B) and connector (C).
   Remove the PCB (A).

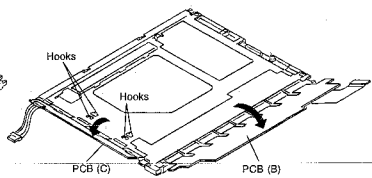

Figure 37

8. Open the PCB (B) and PCB (C)

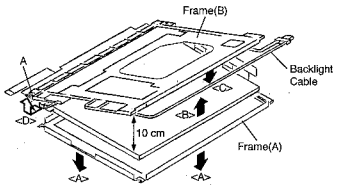

Figure 38

9. Remove the Frame (A) in the direction of arrow <A>.
10. While lifting frame (B) in the direction of arrow <B>, remove the backlight cable in the direction of arrow <C>.
    Remove part A of frame (B) in the direction of arrow <D>.

Caution: Do not lift frame (B) higher than 10 cm.

[Notes when assembling]

- When installing the backlight cable, position frame (B) below as shown in figure 39.

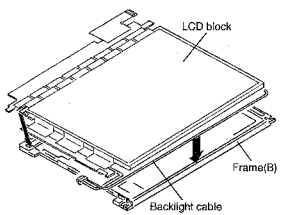

Figure 39

- When installing the LCD block to frame (B) with backlight, align the sheet holes with the alignment ribs as shown in figure 40.

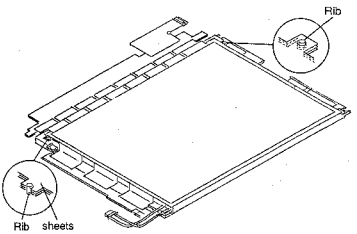

Figure 40

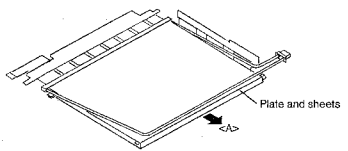

Figure 41

11. Remove the plate and sheets in the direction of arrow.

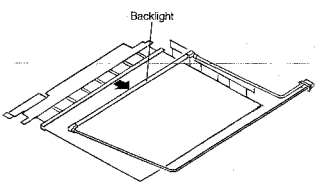

Figure 42

12. Remove the backlight.

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Service Manual

Notebook Computer

CF-45

Supplement-4

TOUGHBOOK 45

Please file and use this manual together with the following Service Manuals.
CF-45 Service Manual (Order No. CPD9806032C0) for original CF-45 models.
CF-45 Simplified Service Manual (Order No. CPD9810044A0)
CF-45 Supplement-1 Service Manual (Order No. CPD9807034S0)
CF-45 Supplement-2 Service Manual (Order No. CPD9808040S0)
CF-45 Supplement-3 Service Manual (Order No. CPD9810051S0)

This is the Service Manual for the following areas.

- [M] ... for U.S.A. and Canada
- [E] ... for U.K.
- [G] ... for Germany
- [F] ... for France
- [S] ... for Sweden
- [T] ... for Italy

Correction

Applied Model

CF-45RJ48xxx

Parts Comparison Table

Refer to page 5-2 of Replacement Parts List (Order No. CPD9810044A0)

REF. NO.	PART NO.		DESCRIPTION	Q'TY
	INCORRECT	**CORRECT**		
Mechanical Parts				
K56	DFHG1103ZA	**DFHG1062ZA**	DAMPER, HDD	2

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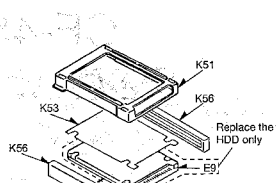
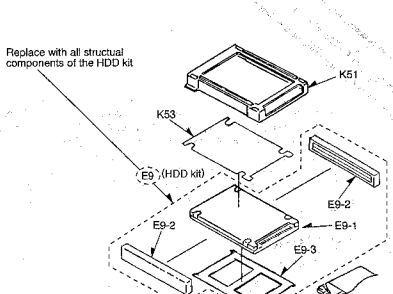
Replacing the HDD

1. When replacing the original HDD (DFJH076ZA-T)



2. When replacing the new HDD (DFWV44K0067)



Parts Comparison Table

(CF-45RJ48xxx)

1. The E9 HDD kit (part no. **DFWV44K0067**) is packaged with E9-1 HDD (part no. **DFJH084ZA-T**), E9-2 HDD dampers (part no. **DFHG1103ZA**) and E9-3 HDD spacer (part no. **DFHR7544ZA**) as a kit.
2. Unit version number **0~3** units contain the **original** HDD.
   However, Unit version number **3** units with serial numbers in the range **3415~4271** contain the **new** HDD.
   Unit version number **4 or later** units contain the **new** HDD.
3. Although the **new** HDD is compatible with the **original** HDD, its shape is different.
   Therefore, the HDD dampers and HDD spacer are different. To replace the HDD, refer to "Replacing the HDD" on the next page.
4. The HDD, HDD dampers and HDD spacer are paired as shown in the table below.

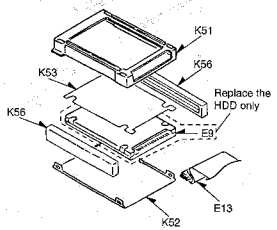
	HDD	HDD dampers	HDD spacer
Original	DFJH076ZA-T	DFHG1602ZA	——
New	DFJH084ZA-T	DFHG1103ZA	DFHR7544ZA

REF. NO.	PART NO.		DESCRIPTION	Q'TY
	ORIGINAL	**NEW**		
Main Block Unit				
E9	DFJH076ZA-T	——	HDD	0
	——	**DFWV44K0067**	KIT, HDD	1
E9-1	——	**DFJH084ZA-T**	HDD	1
E9-2	——	**DFHG1103ZA**	DAMPER, HDD	2
E9-3	——	**DFHR7544ZA**	SPACER, HDD	1
Mechanical Parts				
K56	DFHG1602ZA	——	DAMPER, HDD	0

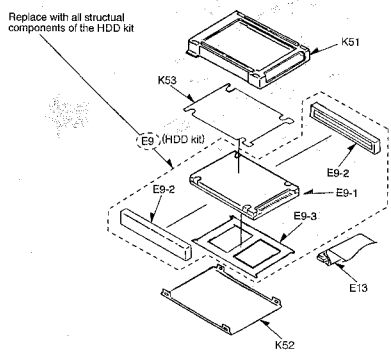
Replacing the HDD

1. For unit version number 0 ~ 3 units (excluding unit version number 3 units with serial numbers in the range 3415~4271)

Original HDD (DFJH076ZA-T) ➡ Original HDD (DFJH076ZA-T)

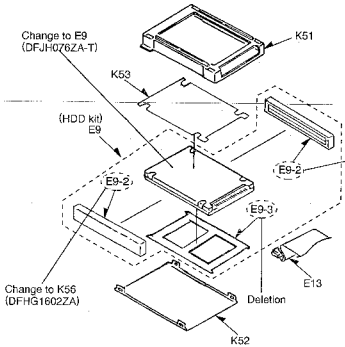


Original HDD (DFJH076ZA-T) ➡ New HDD (DFWV44K0067)

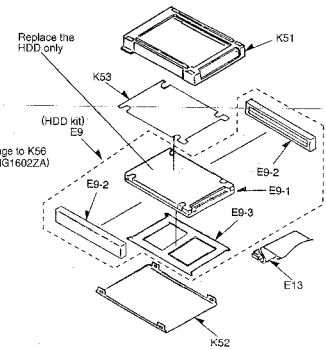


2. For unit version number 4 or later units (including unit version number 3 units with serial numbers in the range 3415~4271)

New HDD (DFWV44K0067) ➡ Original HDD (DFJH076ZA-T)

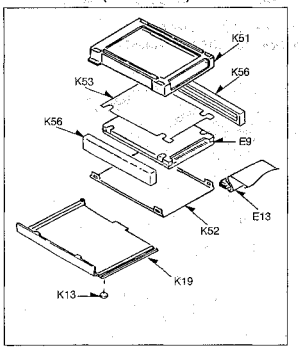


New HDD (DFWV44K0067) ➡ New HDD (DFWV44K0067)

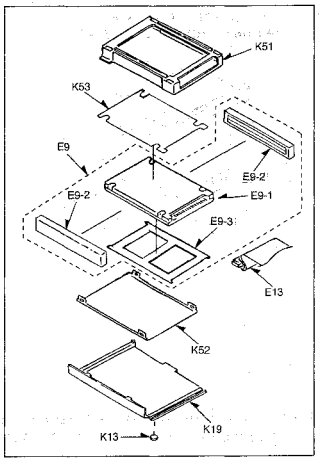


Exploded view

(ORIGINAL)



(NEW)



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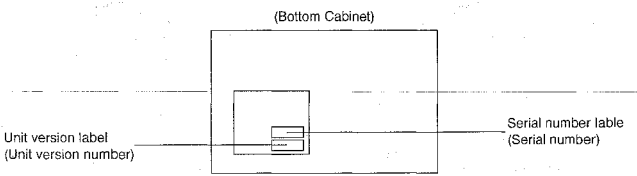

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Service Manual

Supplement-4

Notebook Computer

CF-45

TOUGHBOOK 45

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CF-45 Simplified Service Manual (Order No. CPD9810044A0)
CF-45 Supplement-1 Service Manual (Order No. CPD9807034S0)
CF-45 Supplement-2 Service Manual (Order No. CPD9808040S0)
CF-45 Supplement-3 Service Manual (Order No. CPD9810051S0)

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- [G] ... for Germany
- [F] ... for France
- [S] ... for Sweden
- [T] ... for Italy

Correction

Applied Model

CF-45RJ48xxx

Parts Comparison Table

Refer to page 5-2 of Replacement Parts List (Order No. CPD9810044A0)

REF. NO.	PART NO.		DESCRIPTION	Q'TY
	INCORRECT	**CORRECT**		
Mechanical Parts				
K56	DFHG1103ZA	**DFHG1062ZA**	DAMPER, HDD	2

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Service Manual

Notebook Computer

CF-45

Supplement-6

TOUGHBOOK 45

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CF-45 Service Manual (Order No. CPD9806032C0) for original CF-45 models.
CF-45 Simplified Service Manual (Order No. CPD9810044A0)
CF-45 Supplement-1 Service Manual (Order No. CPD9807034S0)
CF-45 Supplement-2 Service Manual (Order No. CPD9808040S0)
CF-45 Supplement-3 Service Manual (Order No. CPD9810051S0)
CF-45 Supplement-4 Service Manual (Order No. CPD9811053S0)
CF-45 Supplement-5 Service Manual (Order No. CPD9811054S0)

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- [G] ... for Germany
- [F] ... for France
- [S] ... for Sweden
- [T] ... for Italy

Applied Model

CF-45MJx8xxx, CF-45NJx8xxx

Parts Comparison Table

REF. NO. and AREA	PART NO. ORIGINAL	PART NO. NEW	DESCRIPTION	Q'TY
Mechanical Parts				
K6	DFUW0073ZA	**DFUW0073ZB**	SPRING, PC CARD COVER	1
K32	DFMX0536ZA	**DFMX0536ZB**	SHEET, INSULATION, PORT REPLICATOR	1
K35	DFMX0554ZA	**DFMX0554ZB**	SHEET, INSULATION, EXPANSION BUS	1
K36	DFHR7515ZB	**DFHR7515WA**	SHEET, SPEAKER	1
K54 ⚠	DFGT0663ZA	**DFGT0663ZB**	RATING LABEL (CF-45xxxxJxM)	1

Applied Model

CF-45RJ48xxx

Parts Comparison Table

REF. NO. and AREA	PART NO. ORIGINAL	PART NO. NEW	DESCRIPTION	Q'TY
Mechanical Parts				
K32	DFMX0536ZA	**DFMX0536ZB**	SHEET, INSULATION, PORT REPLICATOR	1
K35	DFMX0554ZA	**DFMX0554ZB**	SHEET, INSULATION, EXPANSION BUS	1
K36	DFHR7515ZB	**DFHR7515WA**	SHEET, SPEAKER	1

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Correction

Applied Model

CF-45MJx8xxx, CF-45NJx8xxx, CF-45RJ48xxx

Parts Comparison Table

REF. NO. and AREA	PART NO.		DESCRIPTION	Q'TY
	ORIGINAL	**NEW**		
Mechanical Parts				
K26	DFBC0190ZA-0	**DFBC0193ZA-0**	LEVER, COVER LOCK, HDD	1
K28	DFBC0193ZA-0	**DFBC0190ZA-0**	BUTTON, COVER LOCK	1

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Service Manual

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Supplement-7

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CF-45 Simplified Service Manual (Order No. CPD9810044A0)
CF-45 Supplement-1 Service Manual (Order No. CPD9807034S0)
CF-45 Supplement-2 Service Manual (Order No. CPD9808040S0)
CF-45 Supplement-3 Service Manual (Order No. CPD9810051S0)
CF-45 Supplement-4 Service Manual (Order No. CPD9811053S0)
CF-45 Supplement-5 Service Manual (Order No. CPD9811054S0)
CF-45 Supplement-6 Service Manual (Order No. CPD9903017S0)

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[G] ... for Germany
[F] ... for France
[S] ... for Sweden
[T] ... for Italy

Applied Model

CF-45MJx8xxx, CF-45NJx8xxx, CF-45RJ48xxx

Parts Comparison Table

REF. NO. and AREA	PART NO.		DESCRIPTION	Q'TY
	ORIGINAL	NEW		
Main Block Units				
E10 (M)	DFSX1A71XATG	**DFSX1A71VATG**	KEYBOARD	1
E10 (E)	DFSX1A72XATG	**DFSX1A72VATG**	KEYBOARD	1
E10 (G)	DFSX1A73XATG	**DFSX1A73VATG**	KEYBOARD	1
E10 (F)	DFSX1A74XATG	**DFSX1A74VATG**	KEYBOARD	1
E10 (T)	DFSX1A75XATG	**DFSX1A75VATG**	KEYBOARD	1
E10 (S)	DFSX1A76XATG	**DFSX1A76VATG**	KEYBOARD	1
Mechanical Parts				
K2	DFKF0172XB-0	**DFKF0172XC-0**	BOTTOM CABINET	1

Note: Keyboard of Original and New have the interchangeability.

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Service Manual

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Supplement-8

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CF-45 Simplified Service Manual (Order No. CPD9810044A0)
CF-45 Supplement-1 Service Manual (Order No. CPD9807034S0)
CF-45 Supplement-2 Service Manual (Order No. CPD9808040S0)
CF-45 Supplement-3 Service Manual (Order No. CPD9810051S0)
CF-45 Supplement-4 Service Manual (Order No. CPD9811053S0)
CF-45 Supplement-5 Service Manual (Order No. CPD9811054S0)
CF-45 Supplement-6 Service Manual (Order No. CPD9903017S0)
CF-45 Supplement-7 Service Manual (Order No. CPD9903018S0)

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[G] ... for Germany
[F] ... for France
[S] ... for Sweden
[T] ... for Italy

Applied Model

CF-45MJx8xxx, CF-45NJx8xxx, CF-45RJx8xxx, CF-45DJx8xxx

Parts Comparison Table

REF. NO. and AREA	PART NO. ORIGINAL	PART NO. NEW	DESCRIPTION	Q'TY
Mechanical Parts				
K7	DFWV64A0030		ASS'Y, BATTERY COVER	1
K7-1	————	**DFBC0190ZA-0**	BATTERY COVER LOCK LEVER	1
K7-2	————	**DFBC0191ZA-0**	COVER LOCK BUTTON	1
K7-3	————	**XUC3VW**	E-RING	1
K74	————	**DFQT9655ZA**	SEAL, TOUGHBOOK	1

Applied Model

CF-45DJx8xxx

Parts Comparison Table

REF. NO. and AREA	PART NO. ORIGINAL	PART NO. NEW	DESCRIPTION	Q'TY
Accessories				
A3	DFJN5125ZA	**DFJN5139ZA**	FIRST AID CD	1

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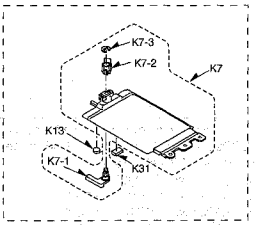
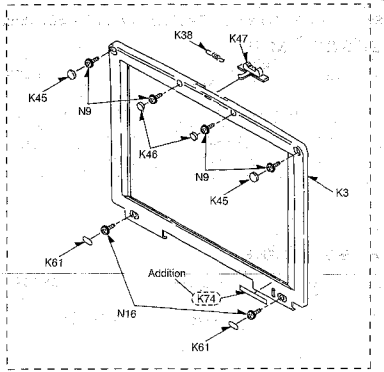
Exploded View





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Service Manual

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CF-45

TOUGHBOOK 45

Supplement-9

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CF-45 Service Manual (Order No. CPD9806032C0) for original CF-45 models.
CF-45 Simplified Service Manual (Order No. CPD9810044A0)
CF-45 Simplified Service Manual (Order No. CPD9901003A0)
CF-45 Simplified Service Manual (Order No. CPD9905022A0)
CF-45 Supplement-1 Service Manual (Order No. CPD9807034S0)
CF-45 Supplement-2 Service Manual (Order No. CPD9808040S0)
CF-45 Supplement-3 Service Manual (Order No. CPD9810051S0)
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CF-45 Supplement-5 Service Manual (Order No. CPD9811054S0)
CF-45 Supplement-6 Service Manual (Order No. CPD9903017S0)
CF-45 Supplement-7 Service Manual (Order No. CPD9903018S0)
CF-45 Supplement-8 Service Manual (Order No. CPD9905021S0)

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- [G] ... for Germany
- [F] ... for France
- [S] ... for Sweden
- [T] ... for Italy

Applied Model

CF-45 All Series

Parts Comparison Table

REF. NO. and AREA	PART NO. ORIGINAL	PART NO. NEW	DESCRIPTION	Q'TY
Main Block Units				
E10 (E)	DFSX1A72VATG	**DFSX1A72WATG**	KEYBOARD	1
E10 (G)	DFSX1A73VATG	**DFSX1A73WATG**	KEYBOARD	1
E10 (F)	DFSX1A74VATG	**DFSX1A74WATG**	KEYBOARD	1
E10 (T)	DFSX1A75VATG	**DFSX1A75WATG**	KEYBOARD	1
E10 (S)	DFSX1A76VATG	**DFSX1A76WATG**	KEYBOARD	1

Applied Model

CF-45MJx8xxx, CF-45NJx8xxx, CF-45RJ48xxx

Parts Comparison Table

REF. NO. and AREA	PART NO. ORIGINAL	PART NO. NEW	DESCRIPTION	Q'TY
Main PCB				
IC21	TFDS6500	**DEDTFDS6000D**	IC, IrDA	1

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Applied Model

CF-45DJ48xxx, CF-45EJ48xxx

Parts Comparison Table

REF. NO. and AREA	PART NO.		DESCRIPTION	Q'TY
	ORIGINAL	**NEW**		
Main PCB				
IC24	TFDS6500	**DEDTFDS6000D**	IC, IrDA	1
IC58	DAF3434T00H7	**DAF3434T007H**	IC, EC	1

Correction

Applied Model

Supplement-5 Service Manual Order No. CPD9811054S0
CF-45MJx8xxx, CF-45NJx8xxx, CF-45RJ48xxx

Parts Comparison Table

REF. NO. and AREA	PART NO.		DESCRIPTION	Q'TY
	ORIGINAL	**NEW**		
Main PCB				
K56 (Correction)	DFHG1602ZA	**DFHG1062ZA**	DAMPER, HDD	2

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Service Manual

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CF-45

Supplement-10

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CF-45 Service Manual (Order No. CPD9806032C0) for original CF-45 models.
CF-45 Simplified Service Manual
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CF-45 Supplemen Service Manual
-1 (CPD9807034S0)/-2 (CPD9808040S0)/-3 (CPD9810051S0)
-4 (CPD9811053S0)/-5 (CPD9811054S0)/-6 (CPD9903017S0)
-7 (CPD9903018S0)/-8 (CPD9905021S0)/-9 (CPD9906033S0)

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- [G] ... for Germany
- [F] ... for France
- [S] ... for Sweden
- [T] ... for Italy

Applied Model

CF-45DJ48xxx

Parts Comparison Table

REF. NO. and AREA	PART NO. ORIGINAL	PART NO. NEW	DESCRIPTION	Q'TY
Mechanical Parts				
K76	————	DFHR8329ZA	FPC CUSHION	1

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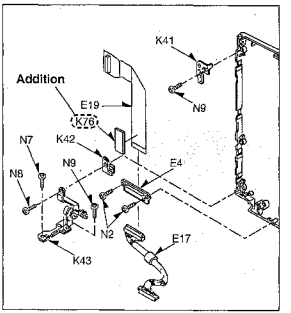

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Supplement-11

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CF-45 Supplement Service Manual
-1 (CPD9807034S0)/-2 (CPD9808040S0)/-3 (CPD9810051S0)
-4 (CPD9811053S0)/-5 (CPD9811054S0)/-6 (CPD9903017S0)
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-10 (CPD9907044S0)

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G ... for Germany
F ... for France
S ... for Sweden
T ... for Italy

Applied Model

CF-45xxxxAorJAx

Parts Comparison Table

(CF-45xxxxAorJAx)

REF. NO. and AREA	PART NO. ORIGINAL	PART NO. NEW	DESCRIPTION	Q'TY
Main Block Units				
E8	DFJG066ZA-M	**DFJG070ZA-M**	FDD	1

(CF-45DJ48AorJAM)

REF. NO. and AREA	PART NO. ORIGINAL	PART NO. NEW	DESCRIPTION	Q'TY
Accessories				
A1 (M) ⚠	DFQX2623ZA	**DFQX2809ZA**	OPERATING INSTRUCTIONS MANUAL	1

(CF-45DJ48AorJAx, CF-45EJ48AorJAx, CF-45FJ48JAM, CF-45UJ48AAM)

REF. NO. and AREA	PART NO. ORIGINAL	PART NO. NEW	DESCRIPTION	Q'TY
Mechanical Parts				
K14	DFHG1214ZA-0	**DFHG1214YA-0**	RUBBER FOOT, REAR	2

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Supplement-12

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Correction

Applied Model

CF-45KJ6GJEM

Parts Comparison Table

Refer to page 5-2, 5-6, 5-7, 5-8, of Replacement Parts List (Order No. CPD0002027A1)

REF. NO. and AREA	PART NO.		DESCRIPTION	Q'TY
	INCORRECT	**CORRECT**		
Mechanical Parts				
K51	DFKE410ZA	**DFKE0410ZA**	HOLDER, HDD(A)	1
Main PCB				
L10, 11	DDBTZ034B-Y	**DDB5Z034B-Y**	FERRITE BEAD	2
R198	EFJ3GEYJ154V	**ERJ3GEYJ154V**	RESISTOR, 1/16W, 150KΩ	1
R425, 426	RFJ6GEYJ222V	**ERJ6GEYJ222V**	RESISTOR, 1/16W, 2.2KΩ	2

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Supplement-14

V22254# 2321014

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(CPD9810044A0)/(CPD9901003A0)/(CPD9905022A0)/(CPD9906029A0)
(CPD9909082A0)/(CPD0002027A1)
CF-45 Supplement Service Manual
-1 (CPD9807034S0)/-2 (CPD9808040S0)/-3 (CPD9810051S0)
-4 (CPD9811053S0)/-5 (CPD9811054S0)/-6 (CPD9903017S0)
-7 (CPD9903018S0)/-8 (CPD9905021S0)/-9 (CPD9906033S0)
-10 (CPD9907044S0)/-11(CPD0004044S0)/-12(CPD0004058S1)
-13(CPD0005004S0)

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G ...for Germany
F ...for France
S ...for Sweden
T ...for Italy

Parts Comparison Table

(All series)

REF. NO. and AREA	PART NO.		DESCRIPTION	Q'TY
	ORIGINAL	NEW		
Main Block Unit				
E12	DFAS20P02ZAN	**L0AA02A00018**	SPEAKER	1
Mechanical Parts				
K36	DFHR7515WA	**DFHR7515VA**	SHEET, SPEAKER	1
K97	———	**DFMX0821ZAT**	SPACER, CUSHON, BATTERY	0→**1**

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Parts Comparison Table
(CF-45DJ48AAx)

REF. NO. and AREA	PART NO.		DESCRIPTION	Q'TY
	ORIGINAL	**NEW**		
Mechanical Parts				
K30	DFMX0537ZAT	**DFMX0537ZBT**	SHEET, INSULATION, RAM CARD	1

Parts Comparison Table
(Except CF-45DJ48AAx)

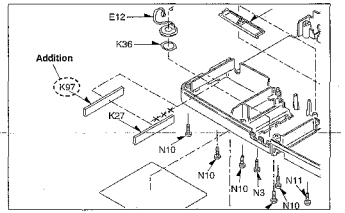
REF. NO. and AREA	PART NO.		DESCRIPTION	Q'TY
	ORIGINAL	**NEW**		
Mechanical Parts				
K30	DFMX0537ZA	**DFMX0537ZBT**	SHEET, INSULATION, RAM CARD	1

Parts Comparison Table
(CF-45KJ6GJEM)

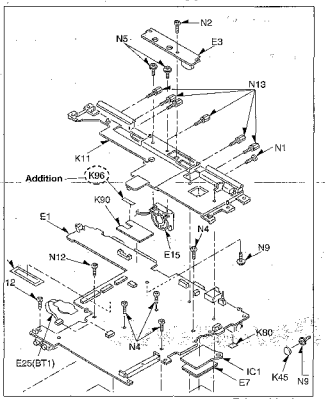
REF. NO. and AREA	PART NO.		DESCRIPTION	Q'TY
	ORIGINAL	**NEW**		
Accessories				
A4 ⚠	CF-AA1639M7	**CF-AA1639AM1**	AC ADAPTOR	1
Mechanical Parts				
K96	———	**DFMX0695ZA**	FUSE SHEET	0→1

[Object: Reinforcement of the insulation measures during MAIN PCB and the LCD cable (EMI cloth).**]**

Exploded View
(CF-45 All series)



(CF-45KJ6GJEM Only)



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Service Manual

Notebook Computer

CF-45

TOUGHBOOK 45

Simplified

Please file and use this manual together with the following Service Manuals.
CF-45 Service Manual (Order No. CPD9806032C0) for original CF-45 models.
CF-45 Simplified Service Manual (Order No. CPD9810044A0)
CF-45 Simplified Service Manual (Order No. CPD9901003A0)
CF-45 Supplement-1 Service Manual (Order No. CPD9807034S0)
CF-45 Supplement-2 Service Manual (Order No. CPD9808040S0)
CF-45 Supplement-3 Service Manual (Order No. CPD9810051S0)
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CF-45 Supplement-7 Service Manual (Order No. CPD9803018S0)
CF-45 Supplement-8 Service Manual (Order No. CPD9905021S0)

This is the Service Manual for the following areas.

- [M] ... for U.S.A. and Canada
- [E] ... for U.K.
- [G] ... for Germany
- [F] ... for France
- [S] ... for Sweden
- [T] ... for Italy

Model Number Reference

The models in the CF-45 series are numbered in accordance with the types of the CPU, LCD and HDD etc. featured by the product.

Model No.CF-45 □ □ □ □ A□J A □

CPU type
E: for Intel® Mobile Pentium® II Processor 300PE MHz

LCD type
J: for 12.1" TFT Color

HDD type
4: for 4.3GB

RAM size
8: 32MB

Area
M: for U.S.A. and Canada
E: for U.K.
G: for Germany
F: for France
S: for Sweden
T: for Italy

Specification

Model No.	CF-45DJ48AA/JAx
CPU	Intel® Mobile Pentium® II Processor 266PE MHz

→

Model No.	CF-45EJ48AA/JAx
CPU	Intel® Mobile Pentium® II Processor 300PE MHz

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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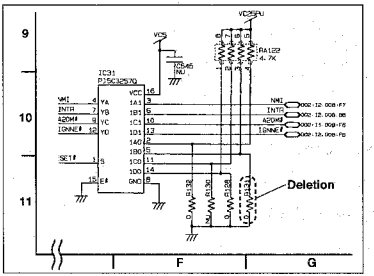
Parts Comparison Table

REF. NO. and AREA	PART NO.		DESCRIPTION	Q'TY
	CF-45DJ48AA/JAx	CF-45EJ48AA/JAx		
Main Block Units				
E1 ⚠	DL3U11001AAA or DL3U11001JAA	**DL3U11001BAA or DL3U11001KAA**	PCB, MAIN RTL	1
Main PCB				
R131	ERJ3GEY0R00V	———	———	0

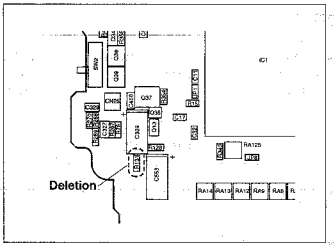
Schematic Diagrams

Main 2 CPU



Printed Circuit Board

3.6 Main PCB <Bottom View>



BIOS-CMOS Map

Token Name	Index [bit]	Bit Width	CK Sum	Factory default	Setup default	Description
cmosMonitorSense	71h[0]	1	O	1h	1h	Monitor Sense Mode 0: Analog Detection 1: Pin Detection
cmosReserveComAMode	71h[2]	3		0h	0h	Reserved
cmosSioNs338ComBMode	71h[5]	2	O	3h	3h	Serial Port B Mode 3: IrDA
cmosSkpMemDefault	72h[2]	1	O	0h	1h	0: Normal Memory Count 1: Quick Memory Count
cmosMemCacheEnable	72h[3]	1	O	1h	1h	L2 cache enable flag 0: Disable, 1: Enable
cmosacpiEnable	72h[7]	1	O	1h	1h	ACPI Enabel flag 0: Disable, 1: Enable
cmosPmPMMode	73h[2]	3	O	3h	3h	Power Saving Mode 0: Off 2: Standard(Battery) 3: Standard(Always) 4: Advanced
cmosPmSuspendTimer	73h[5]	3	O	1h	1h	Suspend timeout 0: Disabled 1: 4 minute 2: 3: 16 minutes
cmosPmPowerButtonMode	74h[0]	2	O	2h	1h	Power Button Mode 0: Suspend 1: Hibernation 2: Off
cmosPmSuspendMode (M)	74h[0]	1	O	0h	1h	Suspend Mode 0: Suspend, 1: Hibernation
cmosPmPowerButton Enabled(M)	74h[1]	1	O	1h	0h	Power Button Enable Flag 0: Disable, 1: Enable
cmosSleepSwitchMode	74h[2]	2	O	2h	2h	Sleep Switch Mode 0: No Action 1: Suspend 2: Hibernation
cmosPmIdleTimer	74h[4]	1	O	0h	0h	Idle Mode power saving flag 0: Off, 1: On
cmosPmStandbyTimer	74h[5]	3	O	0h	0h	Standby timeout (Not set during SETUP) 0: Disabled 1: 5 minutes 2: 10 minutes 3: 15 minutes 4: 20 minutes 5: 30 minutes 6: 40 minutes 7: 60 minutes
cmosPmHDDTimer	75h[0]	4	O	0h	0h	Hard Disk timeout (Not set during SETUP) 0: Disabled 1: 10 seconds 2: 15 seconds 3: 30 seconds 4: 45 seconds 5: 1 minute 6: 2 minutes 7: 4 minutes 8: 6 minutes 9: 8 minutes 10: 10 minutes 11: 15 minutes

Token	Index [bit]	Bit Width	CK Sum	Factory default	Setup default	Description
cmosPmVideoTimer	75h[4]	4	O	0h	0h	Video Timeout (Not set during SETUP) 0: Disabled 1: 10 seconds 2: 15 seconds 3: 30 seconds 6: 2 minutes 7: 4 minutes 8: 6 minutes 9: 8 minutes 10: 10 minutes 11: 15 minutes
cmosPmResRing	77h[7]	1	O	0h	0h	Resume On Modem Ring 0: Off, 1: On
cmosUSBLegacy	78h[7]	1	O	0h	0h	USB Legacy Enable 0: Disable, 1: Enable
cmosUSBEnable	7bh[2]	1	O	1h	1h	USB Enable Flag 0: Disable, 1: Enable
cmosTextExpansionEnable	7bh[3]	1	O	1h	1h	Text Expansion Flag 0: Disable, 1: Enable
cmosGraphExpansionEnable	7bh[4]	1	O	0h	0h	Graphic Expansion Flag 0: Disable, 1: Enable
cmosIPLOrder0	7bh[5]	3	O	0h	0h	Boot Up Drive 0: A:/C: 1: C: 2: CDD/A:/C:
cmosSioNs338ComAConfig	80h[0]	2	O	3h	3h	Serial Port A configuration Mode 0: Disable, 1: 3F8/IRQ4, 3: Auto
cmosSioNs338ComBConfig	80h[2]	2	O	3h	3h	Serial Port B configuration Mode 0: Disable, 1: 2F8/IRQ3, 3: Auto
cmosReserveComCConfig	80h[4]	2		0h	0h	Reserve
CmosSioNs338LptConfig	80h[6]	2	O	3h	3h	Parallel Port configuration Mode 0: Disable, 1: 378/IRQ7, 2: 3BC/IRQ5, 3: Auto
cmosAuYmf744Config	81h[0]	2	O	2h	2h	Sound Controller configuration Mode 0: Disable, 1: Enable, 2: Auto
CmosCardBusPlugEmulation	81h[2]	2	O	0h	0h	CardBus insertion/removal emulation 0: Disable CardBus Controlers A and B 1: Enable CardBus Controler A only 2: Enable CardBus Controler B only 3: Enable CardBus Controlers A and B
CmosCardBusCtrlA PlugEmulation(M)	81h[2]	1	O	0h	0h	CardBus(A) insertion/removal emulation 0: Disable 1: Enable
CmosCardBusCtrlB PlugEmulation(M)	81h[3]	1	O	0h	0h	CardBus(B) insertion/removal emulation 0: Disable 1: Enable
CmosFnF7F10KeyEnable	81h[4]	1	O	1h	1h	Fn+F7/F10 Key active/inactive setting 0: Inactive 1: active

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Service Manual

Notebook Computer

CF-45

Simplified

TOUGHBOOK

Please file and use this manual together with the following Service Manuals.
CF-45 Service Manual (Order No. CPD9806032C0) for original CF-45 models.
CF-45 Simplified Service Manual (Order No. CPD9810044A0)
CF-45 Simplified Service Manual (Order No. CPD9901003A0)
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CF-45 Supplement-8 Service Manual (Order No. CPD9905021S0)
CF-45 Supplement-9 Service Manual (Order No. CPD9906033S0)

This is the Service Manual for the following areas.

- [M] ... for U.S.A. and Canada
- [E] ... for U.K.
- [G] ... for Germany
- [F] ... for France
- [S] ... for Sweden
- [T] ... for Italy

Model Number Reference

The models in the CF-45 series are numbered in accordance with the types of the CPU, LCD and HDD etc. featured by the product.

Model No.CF-45 □ □ □ □ A A □

CPU type
U: for Intel® Mobile Celeron™ Processor 333 MHz

LCD type
J: for 12.1" TFT Color

HDD type
4: for 4.3GB

Area
M: for U.S.A. and Canada
E: for U.K.
G: for Germany
F: for France
S: for Sweden
T: for Italy

RAM size
8: 32MB

Specification

Model No.	CF-45DJ48AAx
CPU	Intel® Mobile Pentium® II Processor 266PE MHz L1 Cache Memory: 32 KB L2 (Second) Cache Memory: 128 KB

→

Model No.	CF-45UJ48AAx
CPU	Intel® Mobile Celeron™ Processor 333 MHz L1 Cache Memory: 32 KB L2 (Second) Cache Memory: 128 KB

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Parts Comparison Table

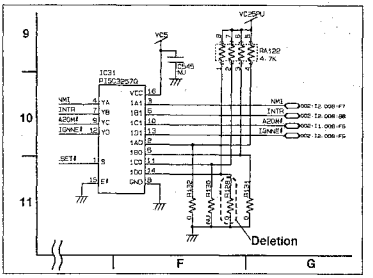
Note: Important Safety Notice

Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

REF. NO. and AREA	PART NO.		DESCRIPTION	Q'TY
	CF-45DJ48AAx	CF-45UJ48AAx		
Main Block Units				
E1 ⚠	DL3U11001AAA	**DL3U11001CAA**	PCB, MAIN RTL	1
Mechanical Parts				
K1	DFWV80A0244	**DFWV80A0237**	ASS'Y, TOP CABINET	1
K11	DFWV61B0003	**DFWV61B0004**	HEAT SINK, CPU (TOP)	1
K73	DFMY0194ZA	————	————	0
K76	————	**DFHE0268ZA**	CONDUCTIVE CUHSION	1
K77	————	**DFHE0269ZA**	CONDUCTIVE CUHSION	1
Packing Material				
P1	DFPK0892YAT	**DFPK0892XAT**	CASE, PACKING	1
Main PCB				
R128	ERJ3GEY0R00V	————	————	0

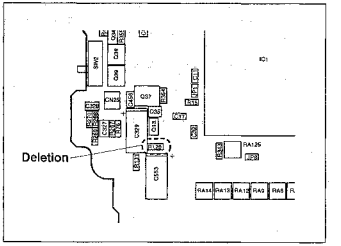
Schematic Diagrams

Main 2 CPU

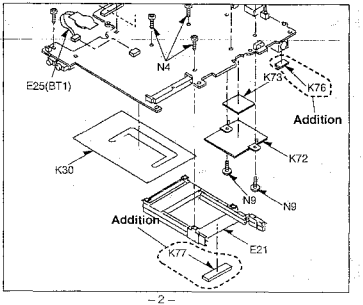


Printed Circuit Board

3.6 Main PCB <Bottom View>



Exploded View



BIOS-CMOS Map

Token Name	Index [bit]	Bit Width	CK Sum	Factory default	Setup default	Description
cmosMonitorSense	71h[0]	1	O	1h	1h	Monitor Sense Mode 0: Analog Detection 1: Pin Detection
cmosReserveComAMode	71h[2]	3		0h	0h	Reserved
cmosSioNs338ComBMode	71h[5]	2	O	3h	3h	Serial Port B Mode 3: IrDA
cmosSkpMemDefault	72h[2]	1	O	0h	1h	0: Normal Memory Count 1: Quick Memory Count
cmosMemCacheEnable	72h[3]	1	O	1h	1h	L2 cache enable flag 0: Disable, 1: Enable
cmosacpiEnable	72h[7]	1	O	1h	1h	ACPI Enabel flag 0: Disable, 1: Enable
cmosPmPMMode	73h[2]	3	O	3h	3h	Power Saving Mode 0: Off 2: Standard(Battery) 3: Standard(Always) 4: Advanced
cmosPmSuspendTimer	73h[5]	3	O	1h	1h	Suspend timeout 0: Disabled 1: 4 minute 2: 3: 16 minutes
cmosPmPowerButtonMode	74h[0]	2	O	2h	1h	Power Button Mode 0: Suspend 1: Hibernation 2: Off
cmosPmSuspendMode (M)	74h[0]	1	O	0h	1h	Suspend Mode 0: Suspend, 1: Hibernation
cmosPmPowerButton Enabled(M)	74h[1]	1	O	1h	0h	Power Button Enable Flag 0: Disable, 1: Enable
cmosSleepSwitchMode	74h[2]	2	O	2h	2h	Sleep Switch Mode 0: No Action 1: Suspend 2: Hibernation
cmosPmIdleTimer	74h[4]	1	O	0h	0h	idle Mode power saving flag 0: Off, 1: On
cmosPmStandbyTimer	74h[5]	3	O	0h	0h	Standby timeout (Not set during SETUP) 0: Disabled 1: 5 minutes 2: 10 minutes 3: 15 minutes 4: 20 minutes 5: 30 minutes 6: 40 minutes 7: 60 minutes
cmosPmHDDTimer	75h[0]	4	O	0h	0h	Hard Disk timeout (Not set during SETUP) 0: Disabled 1: 10 seconds 2: 15 seconds 3: 30 seconds 4: 45 seconds 5: 1 minute 6: 2 minutes 7: 4 minutes 8: 6 minutes 9: 8 minutes 10: 10 minutes 11: 15 minutes

Token	Index [bit]	Bit Width	CK Sum	Factory default	Setup default	Description
cmosPmVideoTimer	75h[4]	4	O	0h	0h	Video Timeout (Not set during SETUP) 0: Disabled 1: 10 seconds 2: 15 seconds 3: 30 seconds 6: 2 minutes 7: 4 minutes 8: 6 minutes 9: 8 minutes 10: 10 minutes 11: 15 minutes
cmosPmResRing	77h[7]	1	O	0h	0h	Resume On Modem Ring 0: Off, 1: On
cmosUSBLegacy	78h[7]	1	O	0h	0h	USB Legacy Enable 0: Disable, 1: Enable
cmosUSBEnable	7bh[2]	1	O	1h	1h	USB Enable Flag 0: Disable, 1: Enable
cmosTextExpansionEnable	7bh[3]	1	O	1h	1h	Text Expansion Flag 0: Disable, 1: Enable
cmosGraphExpansionEnable	7bh[4]	1	O	0h	0h	Graphic Expansion Flag 0: Disable, 1: Enable
cmosIPLOrder0	7bh[5]	3	O	0h	0h	Boot Up Drive 0: A:/C: 1: C: 2: CDD/A:/C:
cmosSioNs338ComAConfig	80h[0]	2	O	3h	3h	Serial Port A configuration Mode 0: Disable, 1: 3F8/IRQ4, 3: Auto
cmosSioNs338ComBConfig	80h[2]	2	O	3h	3h	Serial Port B configuration Mode 0: Disable, 1: 2F8/IRQ3, 3: Auto
cmosReserveComCConfig	80h[4]	2		0h	0h	Reserve
CmosSioNs338LptConfig	80h[6]	2	O	3h	3h	Parallel Port configuration Mode 0: Disable, 1: 378/IRQ7, 2: 3BC/IRQ5, 3: Auto
cmosAuYmf744Config	81h[0]	2	O	2h	2h	Sound Controller configuration Mode 0: Disable, 1: Enable, 2: Auto
CmosCardBusPlugEmulation	81h[2]	2	O	0h	0h	CardBus insertion/removal emulation 0: Disable CardBus Controlers A and B 1: Enable CardBus Controler A only 2: Enable CardBus Controler B only 3: Enable CardBus Controlers A and B
CmosCardBusCtrlA PlugEmulation(M)	81h[2]	1	O	0h	0h	CardBus(A) insertion/removal emulation 0: Disable 1: Enable
CmosCardBusCtrlB PlugEmulation(M)	81h[3]	1	O	0h	0h	CardBus(B) insertion/removal emulation 0: Disable 1: Enable
CmosFnF7/F10KeyEnable	81h[4]	1	O	1h	1h	Fn+F7/F10 Key active/inactive setting 0: Inactive 1: active

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Service Manual

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Supplement-9

TOUGHBOOK

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[G] ... for Germany
[F] ... for France
[S] ... for Sweden
[T] ... for Italy

Applied Model

CF-45 All Series

Parts Comparison Table

REF. NO. and AREA	PART NO. ORIGINAL	PART NO. NEW	DESCRIPTION	Q'TY
Main Block Units				
E10 (E)	DFSX1A72VATG	**DFSX1A72WATG**	KEYBOARD	1
E10 (G)	DFSX1A73VATG	**DFSX1A73WATG**	KEYBOARD	1
E10 (F)	DFSX1A74VATG	**DFSX1A74WATG**	KEYBOARD	1
E10 (T)	DFSX1A75VATG	**DFSX1A75WATG**	KEYBOARD	1
E10 (S)	DFSX1A76VATG	**DFSX1A76WATG**	KEYBOARD	1

Applied Model

CF-45MJx8xxx, CF-45NJx8xxx, CF-45RJ48xxx

Parts Comparison Table

REF. NO. and AREA	PART NO. ORIGINAL	PART NO. NEW	DESCRIPTION	Q'TY
Main PCB				
IC21	TFDS6500	**DEDTFDS6000D**	IC, IrDA	1

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Applied Model

CF-45DJ48xxx, CF-45EJ48xxx

Parts Comparison Table

REF. NO. and AREA	PART NO.		DESCRIPTION	Q'TY
	ORIGINAL	**NEW**		
Main PCB				
IC24	TFDS6500	**DEDTFDS6000D**	IC, IrDA	1
IC58	DAF3434T00H7	**DAF3434T007H**	IC, EC	1

Correction

Applied Model

Supplement-5 Service Manual Order No. CPD9811054S0
CF-45MJx8xxx, CF-45NJx8xxx, CF-45RJ48xxx

Parts Comparison Table

REF. NO. and AREA	PART NO.		DESCRIPTION	Q'TY
	ORIGINAL	**NEW**		
Main PCB				
K56 (Correction)	DFHG1602ZA	**DFHG1062ZA**	DAMPER, HDD	2

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